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Editor - Captain H. GARBETT, R.N. (Retired),

To whom all communications should be addressed.

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Capt. W. H. Moore, D.S.O., R.G.A.
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Capt. V. H. M. de la Fontaine, East Surrey R.
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Capt. H. S. Williams, Dorsetshire Regt.
Capt. B. D. L. G. Anley, D.S.O., Essex Regt.
Capt. R. S. Hamilton-Grace, Durham L.I.
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Capt. P. S. Allen, Gordon Highlanders.
Capt. J. K. Cochrane, Leinster Regt.
Capt. R. L. Ricketts, Indian Army.
Capt. W. K. Bourne, Indian Army.
Capt. F. W. Lumsden, Royal Marine Artillery.

And the following received nominations:—

Captain H. C. Bickford, 6th Dragoon Gds.
Captain C. J. C. Grant, Coldstream Gds.
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Captain C. H. Harington, D.S.O., Liverpool R.
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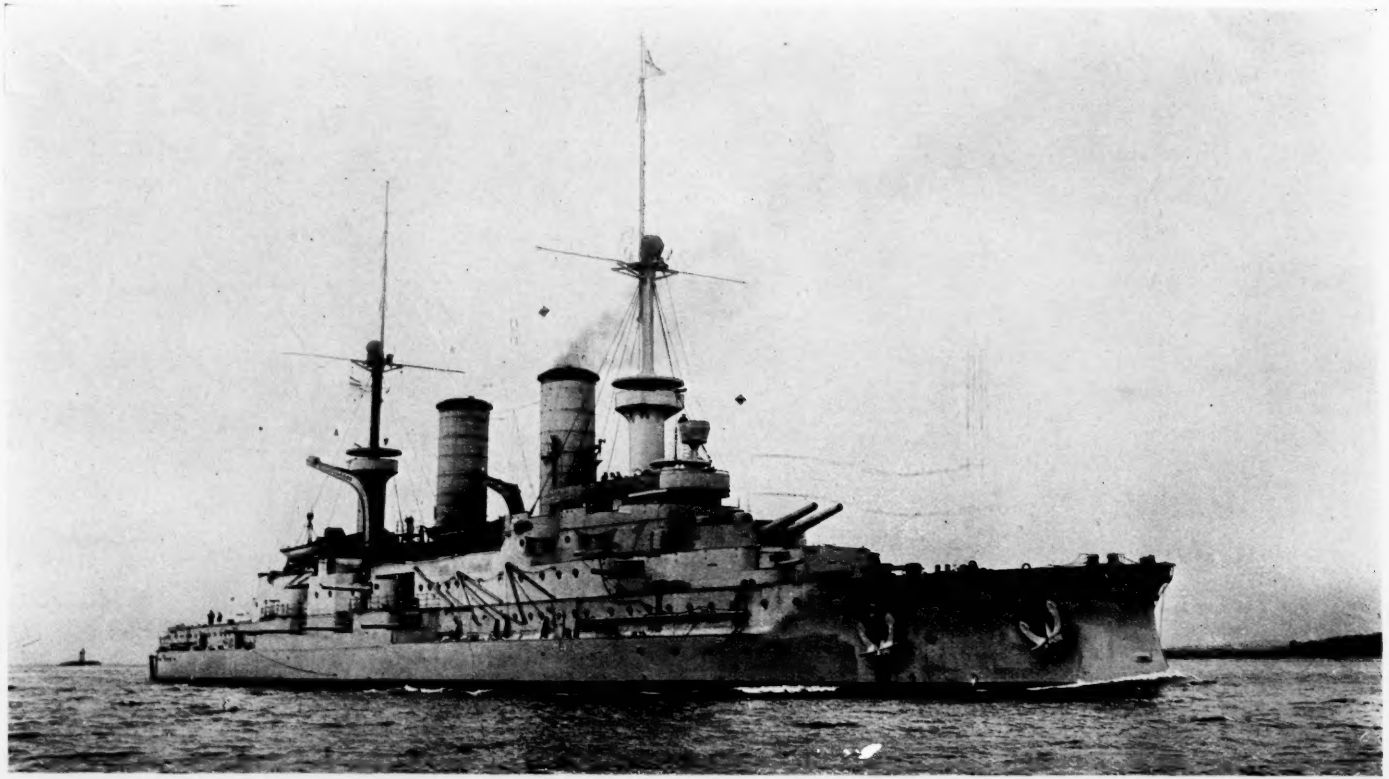

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THE JOURNAL
OF THE
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VOL. LI. JULY, 1907. No. 353.

[*Authors alone are responsible for the contents of their respective Papers*].

SECRETARY'S NOTES.

1. The following officers joined the Institution during the month of June :—

Captain C. E. Hunter, R.N.
Lieutenant C. G. Hoare, Indian Army.
Captain W. K. Bourne, Indian Army.
Captain R. R. Hill, R.G.A.
Lieutenant J. C. Bowen-Colthurst, Royal Irish Rifles.
Second-Lieutenant F. T. V. Dunne, Royal Scots Fusiliers.
Sub-Lieutenant P. T. G. Methuen, R.N.
Lieutenant T. H. Howard, 2nd V.B. Devonshire Regiment.
Lieutenant K. B. Ferguson, R.G.A.
Colonel A. de. S. McKerrell, Cameron Highlanders.
Captain F. W. Van der Kiste, R.G.A.
Lieutenant G. Gregory, R.N.R.
Colonel A. W. Money, R.A.

(No officer of the Militia or Imperial Yeomanry joined the Institution during the month.)

2. The Council have pleasure in reporting that up to the end of June the list of members shows an increase of 28. During the half year 143 officers joined the Institution, the various branches of the Service being represented as follows :—

Regular Army	95
Royal Navy	17
Volunteers	17
Imperial Yeomanry	6
R.N.R. and R.N.V.R.	4
Militia	3
Royal Marines	1
Total	143

Seventy-one members have died, of whom 25 were life members, and 44 have resigned membership. It is hoped that members will not relax their energy in the direction of introducing new members.

3. WINTER ESSAYS.—The attention of Officers is drawn to the new JOURNAL index lately printed. Contained in it are references to almost every possible subject for these essays; the back numbers of the JOURNAL in which the papers appear can always be obtained at the Institution. The price of the Index is 1s.

4. CLOSING OF BUILDING.—The Building will be closed for cleaning purposes from the 5th August to the 17th August inclusive.

5. LENDING LIBRARY.—Officers resident in the British Isles may borrow four volumes at a time from the Library on paying an extra subscription of ten shillings per annum. Further particulars will be sent on application.

6. JOURNAL INDEX.—The JOURNAL index for the past six months is issued loose with this number of the JOURNAL.

7. CHANGE OF RANK OR ADDRESS.—The attention of members is called to the necessity for communicating any change of address or of rank to the Secretary. It is essential that such changes should be made in writing. If such changes are not notified, members will themselves be responsible if their JOURNALS fail to reach them through being wrongly addressed.

THE "Q" CLUB PRIZE ESSAY OF 1906.

"LESSONS TO BE LEARNED BY REGIMENTAL OFFICERS FROM THE RUSSO-JAPANESE WAR."

By Captain ASHLEY W. BARRETT, 16th Middlesex (London Irish) V.R.C.

Motto:—
"Pour Bien Desirer."

AUTHORITIES CONSULTED.

1. Military Attachés from various Governments with the Russian Manchurian Armies.
2. Ditto, ditto with the Japanese Armies in Corea and Manchuria.
3. The Military Correspondents of the *Times* and of various other English newspapers.
4. General Sir Ian Hamilton, "Leaves from the Diary of a Staff Officer."
5. W. Maxwell, "From the Yalu to Port Arthur."
6. Lord Brooke, "An Eye-witness in Manchuria."
7. Bennet Burleigh, "Japan and Russia at War."
8. Joubert, "Russia as it really is."
9. Kakuso, "Awakening of Japan."
10. Krause, "The Far East."
11. Scherer, "Young Japan."
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15. Whigham, "Manchuria and Corea."
16. Wright, "With Togo."
17. Palmer, "With Kuroki in Manchuria."
18. Asakawa, "Russo-Japanese Conflict."
19. Baring, "With the Russians in Manchuria."
20. Seaman, "From Tokio through Manchuria with the Japanese."
21. JOURNALS of the Royal United Service Institution.
22. Ashmead-Bartlett, "Siege of Port Arthur."

23. The UNITED SERVICE MAGAZINES. Articles by Captain Holbrook and others.

24. McCullagh, "With the Cossacks.

25. Captain Soloviev, "Personal Observations of a Russian Company Commander." Published in the *Revue Militaire des Armées Etrangères.*

26. General de Négrier. Articles on the Russo-Japanese War. Published in *Revue des Deux Mondes.*

27. Captain Vincent, R.A., with Japanese 1st Army, "Notes on Artillery and Infantry."

28. Major Balck, C.V.O., of the 19th German Infantry Regiment, "Tactical Lessons from the War in Far East," published in the *Militär-Wochenblatt.*

29. Handbook of the Russian Army, 1905.

30. Ditto, ditto Japanese Army, 1901.

31. "Tactical Notes on the Russo-Japanese War," by the General Staff, War Office.

32. "Lessons of the War," by Captain Neznamov, published in *Ruskii Invalid* during the year 1905.

33. "Infantry in Attack and Defence," by General Pilcher, published by the Aldershot Military Society.

34. "Lessons from the Russo-Japanese War," by Colonel Haldane, published by the Aldershot Military Society.

35. "The Russo-Japanese War," compiled by the General Staff of the War Office. Part I.

INTRODUCTORY.

The Titanic struggle on land and sea between the Russians and Japanese is characterised beyond all warfare that has preceded it by the vastness of the hosts engaged and the employment on a large scale of the most recent implements of destruction. To the student of war it must long be replete with interest, for he will find every phase of conflict represented. He may study the crossing of a river in the face of an enemy entrenched on the opposite bank. He will see a first-class fortress besieged throughout a year by sea and land, and the mountains and plains of a large territory over-run by a multitude of armed men, fighting battles of many days' duration. He may study dashing cavalry raids on the largest scale, wide enveloping movements, and every phase of night operation. If the student be a regimental officer he will best draw lessons by grouping his material in some logical sequence. He will study the two fighting nations. Then his attention will be directed to their troops, armaments, and equipments, and their methods of fighting; but although the larger questions of strategy and politics lie somewhat outside the scope of his present enquiry, he should not ignore them.

THE RUSSIAN AND JAPANESE NATIONS.

The mighty Sclavonic race outnumbered by three to one its diminutive Japanese enemy, yet it contained sources of weakness which

pre-ordained its failure despite that virtue which is said to lie in big battalions. The Russian people are ignorant, negligent of sanitary matters, slow, long suffering, with such endurance as is shown by the beaten hound, drunken, and corrupt; but yet with a traditional reverence for their "Little Father"—the Tsar. The Japanese are educated, the majority being able to read and write, cleanly in person and habits, quick to move, stoical in their capacity for bearing pain, as shown by the frequent absence of anæsthetics for minor operations, abstemious in food and drink, and without reproach in regard to their mode of handling public funds. The spirit of the people is well illustrated by the refusal of a Japanese lady to receive her husband who had preferred to surrender rather than to die. The spirit of an Army reflects that of the nation which produces it, and the Shintoistic creed of Japan has produced a nation of warriors. To a Japanese his Emperor is as a god, who must be implicitly obeyed, and for whom if need be life must be given. Every Japanese is said by Kirton in the JOURNAL of the R.U.S.I. to be a patriot eager to serve his country in fighting Russia. To the higher officer it was no disgrace to learn the secrets of Port Arthur as a hair dresser in a barber's shop. To the peasant it was honourable to carry supplies through Corea for a pittance of 1½d. per diem, with his rations and uniform.

RUSSIAN OFFICERS.

The Russian officer is brave, but dissolute, vain, badly instructed in military matters, and corrupt. An officer, for instance, boasted to a military attaché of the profits he had made out of money provided by Government for the horse rations of his squadron. By its lavish distribution of honours, the Russian authorities lessened the value of their inducements to deeds of merit, and their medals became of small account. This was shown by the naïve remark of an officer to a military attaché: "Our Government really ought not to be accused of extravagance in giving medals, because there are still a great many officers who have not yet been decorated."

JAPANESE OFFICERS.

The Japanese officer is temperate, receptive of Western ideas, well taught, and ready to sacrifice himself to his ideals. For example, the officers on a Japanese transport captured by the Vladivostok cruisers committed "hara-kari" to avoid surrender. It is also recorded that officers were known to attach Shimose bombs to their belts and leaping into the Russian trenches to perish with their enemies. It is also said that they would swim with torpedoes at night for the purpose of destroying with more certainty an opposing ship. The Japanese officer possesses to the full those soldierly traits which commend themselves to the Western mind. He shows a *suaviter in modo* under hardship which lessens the friction of military life. He carries out instructions from a superior zealously, and does so, let it be noted, without destructive criticism. He is filled with the Bushido spirit of the old Samurai, which teaches him to seek death in serving his Mikado, and to look forward to happiness in the shades when, by gallant deeds, he has won the worship of posterity and secured honour to his

family. Diligent in the study of his profession, he carries a leather dispatch case on his belt, containing maps, paper and sketching materials, which are frequently made use of. Like most Orientals, he has a capacity for hiding what he does not wish to reveal, and the reticence of officers in regard to military matters is, indeed, an object lesson to many of our European soldiers. General Sir Ian Hamilton notes that on meeting a Japanese company officer he would appear ill at ease and glance cautiously around lest any field officer should see him talking, although he might be only professing ignorance of well-known matters. If met on the hill-tops the same officer would be quite cheery and chatty, though always guarded. The author of "The Siege of Port Arthur" speaks with approval of the unostentatious manner of living practised by company officers, who fared as their men did and lived with their companies. As to whether this be in all ways good is open to question, inasmuch as to his valet no man is a hero, and influence may be impaired by over much familiarity. It would seem that the Japanese officer shows a certain Trans-Atlantic ingenuity in adapting means to ends which doubtless makes for success in the business of fighting. For instance, it is noted in the R.U.S.I. JOURNAL that the transport officers would number the faces of their Corean Coolies, who otherwise looked much alike, painting on the figures with some indelible, non-irritating pigment; also that the cavalry officers devised and used an ingenious field farriery kit contained in two boxes on pack horses. In one were tools, nails, shoes, etc., and in the other was charcoal and a flexible tube. The bottom of the latter box was moveable, and thus a bellows was extemporised so that the charcoal put into a hole rapidly scooped in the ground could be made incandescent and a cast shoe speedily replaced. The foregoing observations concerning the commissioned ranks of the combatants suggest that, given courage and physical training in officers, their value as fighting men will be proportionate to the intelligence they show in—

a. Carrying out the orders and intentions of their commanders, who, owing to wide extensions, are unable to exercise personal supervision.

b. In learning from and not despising the enemy. The Russians despised the Japanese, and, wilfully blinding themselves to their fighting efficiency, courted the disasters which overtook them. The Japanese intelligently studied European methods for 25 years, and at times improved upon them.

RUSSIAN RANK AND FILE.

The rank and file of the combatants reproduce the virtues and vices of their commanders. The Russian men are powerful, good marchers, and until recently they were accustomed to cover the 4,500 miles to East Siberia on foot. They are disciplined to hold on tightly to their trenches in spite of being heavily pounded. They are brave and persistent, as shown at Liao-Yao, when a regiment of the 1st Siberian Army Corps, which had just lost 50 per cent of its strength, renewed the attack without hesitation on the command. They are, however, slow, unintelligent, and untrained in musketry, signalling, reconnaissance and reporting.

JAPANESE RANK AND FILE.

The Japanese soldier is the fittest of the fit, and is well trained in running and marching. In practising the attack after the battle of the Yalu a Japanese company was seen by General Sir Ian Hamilton to sprint 400 yards at a stretch. This evidences fitness, although so lengthy an advance conduces to loss, and does not accord with the teaching of our Drill Book. In carrying out peace manœuvres near Tokio after the conclusion of the war, an infantry company, marching in column of route, on receiving a whistle and hand signal from their commander, was seen by Colonel Coddington to instantly and silently extend at racing pace along a line at right angles to the direction in which it was previously moving. The Japanese is a trained athlete, a skilled climber, and a good swimmer. At the crossing of the Yalu many of the 1st Army found it necessary to prove themselves such. He is cheery under misfortune, and runs with a smile to certain death at the call of duty, as at the night attack on Three Rock Hill, when 200 men were called for and at once volunteered to climb the walls of a village in order to burn out two companies of Russians. They were nearly all shot down within a few minutes after their entrance. (Report of military attaché.) He is a nimble and intelligent fighter. At Pitsewo a company of Japanese attacking Russian entrenchments were met by a withering fire, and the survivors, immediately scattering on their own initiative, doubled round to a flank so as to enfilade the defenders. (Report of military attaché.) As to musketry, he is less perfect and compares to his disadvantage with the skilled Boer marksman. It was noted, however, that independent fire was generally used by the Japanese, while the Russians adhered to the old-time volley firing. In signalling he is imperfectly educated, but this applies with more force to the Russian troops, and will be referred to later on. In reconnaissance and reporting he is better trained than the Russian, though this is but scanty praise, inasmuch as the latter quite neglects these important duties. He is rendered more efficient by being provided, according to a writer in the R.U.S.I. JOURNAL, with excellent field glasses and maps—useful aids in these days of wide extensions and long-range weapons.

CAVALRY.

This arm was badly represented in the armies of the combatants. The Russian cavalry was numerous and well mounted, but its reconnaissance was a failure and its reports were regarded by the higher commanders as being so unreliable that when, as at the battle of Vafango, they reported correctly to General Stakelberg's Chief of the Staff the Japanese turning movement on the Russian right, which eventually drove the latter northwards towards Mukden, their reports were ignored, and Stakelberg sent his reserves to reinforce his left, where the pressure was comparatively light. In place of using their cavalry to collect information, the Russians would carry out a reconnaissance in force, admittedly a costly and dangerous proceeding, because made without proper knowledge of the enemy's strength, and doubtless the war fog in which the Russians moved in Manchuria was in great part brought about by the ineffective use and defective training of their mounted troops. The Japanese cavalry was poorly mounted. Had it been better horsed, their victories would have been attended with more striking results, and, in the opinion of some of the

military experts with their armies, they would have been in occupation of Mukden by August, 1904. It is said, however, by the *Times* correspondent that their Government is now making efforts to improve the horses in Japan by gelding all two-year-old stallions which are not passed by official examiners. The chances for the use of shock tactics by the mounted troops in Manchuria were few and far between. The mountainous character of the eastern part of the country, the dense crops of kaoling ten feet in height which covered the closely cultivated flat lands in the neighbourhood of rivers, the broken muddy roads, and the steadiness of the infantry on both sides all combined to prevent such.

The criticisms upon the cavalry operations, contributed by General Négrier to the *Revue des Deux Mondes*, are worthy of all consideration. The work of the Russian cavalry he regards as disappointing in every way. They numbered 17,000 well-mounted troops; but if the function of cavalry be to reconnoitre, to cut communications, and to fight, they can be considered only to have failed persistently. Their reconnaissance was checked in all directions by the small detachments of all arms with which the Japanese surrounded themselves. These sheltering in the countless Chinese villages, whence for a reason shortly to be mentioned, they could not be dislodged, proved an impenetrable barrier to the enterprise of the Russian mounted troops, and behind their cordon of small detachments the Japanese armies manœuvred unknown to their enemy. The Russian cavalry were armed with carbines without bayonets, and were accompanied by horse artillery. On encountering Japanese mounted troops the latter would fall back upon the village occupied by their infantry, and it was found impossible to dislodge them with the ineffective guns carried by the Russians. Nor could the latter, when dismounted, push home their attack owing to the absence of bayonets. If by good fortune a Russian reconnoitring detachment passed through the cordon, its retreat was interrupted and the information collected was meagre. Useful work on a few occasions only was done, and then reconnaissance was carried out by small patrols moving by night and hiding by day. In regard to the Russian attempts to cut communications, no favourable account can be given. Mishchenko's raid with 5,000 cavalry and 3 H.A. batteries in January, 1905, best illustrates the Russian difficulties and failures. The Japanese were then near Mukden, and it was felt that their long line of communication, stretching south to Niuchwang, rendered them specially vulnerable. The raiding force, having crossed the frozen Hun-Ho into Chinese territory, moved south to the rear of the Japanese left. A detachment was sent to the east to demolish the railway supplying the Japanese, and retired after having destroyed 500 yards of rail, which was subsequently repaired in a few hours. The main body attacked Yinkow Station, in which were 1,000 Japanese infantry, on whom they made no impression, and by whom they were repulsed. A few stores were burned, and the Russians retired, having achieved practically nought, beyond demonstrating the disadvantage at which they were placed through the absence of effective guns. In regard to the use of cavalry during the combat, General Négrier's remarks are forcible and to the point. The extent of ground over which a modern battle is waged is so vast, as when at Mukden troops were engaged on a front of 100 miles, that infantry general reserves are unable to be moved with sufficient rapidity to repel a sudden enveloping movement. This can be dealt with only by utilising the

mobility of the cavalry, and in this direction lies their proper *rôle*. Thus, when at Mukden the Russian right was turned by Nogi's army, and a powerful Japanese detachment penetrated a gap in the Russian front, the Russians might still have held their own had they used part of their 17,000 mounted troops for repelling the flank attack and a portion for stopping the gap.

It is interesting to note how reconnaissance, raiding, and combat were carried on by Japanese cavalry. In regard to the first, reports and information are said by General Négrier to have been little demanded from the mounted men; these were transmitted more surely by an elaborate system of espionage carried on by Chinese and Japanese trained for this during previous years of peace. Their raids—as when their cavalry cut the railway to the north of Mukden—were more effective than those of the Russians, because the latter had not surrounded themselves with such protective detachments as those previously spoken of. In action their cavalry played its proper *rôle*, as when at Te-li-ssu a body of 2,500 mounted men moved rapidly to the rear of a Russian force which was turning the Japanese right, and, attacking them in reverse, snatched victory from what threatened to be a defeat.

The lessons that General Négrier and some other authorities would urge from the foregoing may thus be summarised:—

a. Cavalry should be regarded as mobile infantry, and should be armed with infantry rifles and bayonets. The lance should disappear, to be replaced by the sword; and at once and for ever abandoning their mounted attack, save when in pursuit of a beaten foe, they should learn to fight effectively on foot.

b. The rifle should be carried in a spring clip hung on the left side of the saddle, so that the man may not be injured by it if he fall. He should be clothed in the South African slouch hat as shelter from sun and rain. He should wear loose trousers, gaiters, and strong boots for dismounted work, and should carry a rain-proof woollen poncho on the front of his saddle. All this accords with the orders issued by Napoleon to his cavalry in 1812.

c. To mounted troops should be attached batteries of light horse artillery, and also portable howitzers firing heavy H.E. bombs, so that their enterprise may not be checked by every paltry village which harbours the enemy.

d. The work of reconnaissance should be relegated to a small number of highly trained officers and men specially fitted for so difficult a task, and mounted on the best horses procurable.

e. The bulk of the cavalry should make it their business to maintain contact with the enemy, to operate on his flanks and rear, to rapidly reinforce threatened points, to engage in attack or defence armed with the infantry rifle and bayonet, and to complete by mounted attacks the discomfiture of a beaten foe.

A reference to "The Hand Book of the Russian Army," published in 1905, and prepared by the General Staff of our War Office, shows that the drastic changes foreshadowed by General Négrier have now

been in great part adopted by the Russian cavalry. In each cavalry regiment there are now two groups of specially trained men. One consists of 16 detached men under an officer trained carefully in reconnaissance. The other of two officers and sixteen men trained in destroying railways and telegraphs and in establishing telegraphic and other systems of signalling. Without doubt this method of specialising will contribute to efficiency in the future. The whole of the Russian Regular cavalry is now armed with the rifle and bayonet, the combined length of which is 5 feet 5½ inches, and the total weight nine pounds. The rifle is slung across the back, muzzle upwards, the butt being behind the right hip. A curved sword weighing 2¼ lbs., and with a blade 34½ inches long, is also carried, with a scabbard for the bayonet attached to the outside of the sword scabbard. Each man carries 45 rounds S.A.A., and a further 180 rounds per man are carried in the regimental transport. The lance is carried only by the front ranks of certain regiments, and by them only at ceremonial parades. The Cossack cavalry are armed similarly to the foregoing, with the exception that the bayonet is not carried, and that on active service a 7-lb. lance, 9 feet long with no pennon, is carried by the front ranks.

In regard to the method of using cavalry in the future, the teaching of the "Tactical Notes," published by the General Staff of our War Office, and based on the reports of our military attachés, is not very decided. In the opinion of our authorities, this would seem to be still *sub judice*, and the time to be not yet ripe for a definite pronouncement. They admit the infrequency of shock tactics, although the terrain in Western Manchuria was not always unsuited to such; but they attribute this to the absence of Russian dash and to Japanese deficiency in men and horses, rather than to the stopping power of the modern magazine rifle. The impression on a student of these "Tactical Notes" is that our experts still attach importance to the cavalry charge, and are not yet willing to transform the cavalryman into the mounted infantry soldier. Manifestly it is not for one whose knowledge of mounted tactics is theoretical only, to venture to express an opinion when experts are at variance.

Artillery.

The lessons taught by the artillery in Manchuria are plainly set forth in the reports of various military attachés, and in the comments of various English and Continental experts.

In Regard to the Value of Artillery Fire and to its Employment.—The artillery preparation no longer marks the initial stage of the fight. The duel between the opposing guns will not necessarily precede the infantry attack. The foot soldiers will advance and the guns will support them, firing, when able, upon the enemy's artillery and his troops, whether entrenched or in the open. The guns when overpowered will, if they are wise, lie silent until they find a target. The need for such silence was well shown at the Yalu, when the Russians, by continuing an unequal artillery duel, were deprived of the weapons which would have been invaluable at a later stage of the battle; and, on the other hand, it is said by Captain Soloviev that a Japanese battery, when the Russians had got its range, would become silent and steal quietly away to open from some new position, leaving a few beams lying on broken gun wheels to simulate it in its former position. It is interesting to note the small damage resulting from

the dust and din of bursting shrapnel. By one observer it is computed that not more than 7 per cent. of all the casualties were caused thereby. As to its effectiveness, however, in subduing fire from the trenches and in causing the defenders to hide their heads there can be no doubt, and at times it caused heavy loss to formed bodies of troops in the open, as when at Mo-tien-lingh a Japanese battery, firing at 3,000 yards upon a Russian battalion in close formation, caused 300 casualties in a few minutes. The Japanese were no believers in breaking up a battery, which, with its six guns, formed their fighting unit, but as a rule their batteries were not placed in contiguity when in action. Thus they were enabled to deliver fire upon the same objective from various directions, and concealment was facilitated. The Russian Captain Neznamov, urges the folly of massing batteries in conspicuous positions on a sky-line, although at times the Japanese would assemble their guns with excellent results, as when at the Yalu they grouped their six batteries of howitzers and masked them on the Island Kintei, whence they sent a crushing fire, and again at Te-li-ssu on the 15th June, 1904, when their eighteen batteries formed the pivot of the turning movement which drove General Stackelberg from his defensive position.

Concerning the Guns.—It is remarked by the *Times* correspondent (an experienced and careful observer) that the Russian Field guns outranged those of their enemies, and threw a 14½-lb. projectile, as against the 11-lb. shell of the Japanese. Their rate of fire he also observed was so much greater that the gunners of the latter, unable to reply to the distant guns which showered shrapnel upon their emplacements, would hide in their shelters until, with loss of time and life, they had moved their guns forward. The india-rubber buffers and springs used by the Russians for checking the recoil of their Q.F. guns were apt to give way under the stress of heavy firing, and in this respect and also in regard to the rapidity with which fire could be maintained, they are believed to be inferior to the latest gun in our own Service. The value of the long range Q.F. guns was made evident throughout the campaign; but a gun to possess these qualities must perforce be a heavy gun, and the factor determining its possible weight was shown to be the quality of the team which moved it. The Russian horses are strong; those of Japan are small and weedy. The guns of the latter were therefore inferior to those of their enemy, and had not their gunners shown more dash and skill, they would have suffered more severely. The absence of good horses doubtless prevented them from using horse artillery, and so, by lessening the value of victory, protracted the war. It may be rightly held that the weight of the gun should be limited only by the possibility of moving it in effective support of infantry, the speed of which when engaged in the attack is less than in former days.

In Regard to the Gunners.—The value of the man behind the gun was again demonstrated up to the hilt. The Japanese gunner was evidently more practised, and perhaps more accustomed to see smokeless powder used at home in his artillery manœuvres. He showed himself, at any rate, an adept at ranging, firing accurately, and hiding his gun positions. Captain Soloviev speaks admiringly of the way in which he would sometimes find his target at the first round without ranging, and also notes that he has seen Japanese shells literally following the movements of a party of mounted infantry scouts going along a ridge at full gallop, with the result that 12 men

and 19 horses were quickly put out of action. The more accurate shooting of the Japanese doubtless came from their previous training, whereas it is said that the only instruction given to many Russian artillerymen was that imparted verbally in the railway carriage *en route* to Siberia.

The Direction of Artillery Fire.—From the Japanese mode of directing their artillery fire something may be learned. Their officers would not, so it is said by a military attaché, remain sheltered under cover, but would be posted in such positions, not necessarily in immediate proximity to their guns, as would enable them to observe and direct their fire. From an observation station on some neighbouring hill messages reporting results would also be sent down to the O.C. the Battery, either by telephone or flag signal. With the advanced attacking party also would move an artillery non-commissioned officer with 2 or 3 orderlies, who contributed to keep the O.C. the Battery *au courant* with the wants of the infantry.

The Co-operation of Guns with Infantry.—The importance of co-operation between guns and infantry was made evident. The Japanese would move their artillery up in close support of their attacking troops, and would not hesitate to take the risks attending such action in order that they might throw their shrapnel into the trenches till the last moment. Their fire, guided by the flags in the Japanese firing line, was delivered finally at 2,000 yards or less, and it was no unusual thing for the O.C. a Battery to be requested by the O.C. an Infantry Company to throw a few rounds into some indicated part of the enemy's lines. This intelligent co-operation between infantry and artillery was so evident to one of our military attachés that he was impressed with the importance of attaching batteries to brigades to serve under the orders of the brigadiers thereof.

The Supply of Ammunition to the Guns.—The difficulty in effectively supplying ammunition to the Battery in action was often manifest, and thus may be explained the rarity on both sides of rafale fire. Owing to the shrapnel searched ground in its rear the ammunition wagons were often placed at a distance of 500 yards, and this necessitated laborious hand carriage, and frequently prolonged silence on the part of the guns.

Heavy Guns.—For the first time in the history of war new armaments and ammunition have been used on a large scale, and this renders the Manchurian campaign instructive to students. The terrible roads, abounding in mud holes 3 to 4 feet deep, prevented much movement of heavy guns. These were, however, largely used by the Japanese during the Port Arthur siege, and they delivered indirect fire, directed from high observation posts, upon the Port Arthur battle-ships. So accurate was, then, the practice that the "Poltava" was hit 21 times. They were also employed at Liao-yang, being carried north on the Manchurian Railway.

H.E. Shells.—Shells loaded with H.E. proved very useful to the Japanese for ranging, owing to the conspicuous cloud of dust raised when bursting. The moral and physical effect caused by their explosion in the trenches was so great that a Japanese artillery officer considered that 50 per cent. of the ammunition carried by a battery should be of this nature. The Shimose shells, however, were less destructive to troops than those loaded with shrapnel, because their steel casings through the sudden

violence of the explosion were scattered in dust-like particles. They were, nevertheless, much disliked by the Russians, owing to the suffocating poisonous vapours evolved.

Explosives Used.—The Russian explosive produced less heat and destruction of the guns than that used by the Japanese or ourselves, but by causing a light brown smoke at the point of discharge somewhat revealed the gun positions. The Japanese explosive was quite smokeless.

Howitzers.—The positions of the howitzer guns were well hidden by the Japanese. They would dig a hole in the ground for an emplacement, and in front of the gun would set up a few trunks of trees connected by cross pieces, on which green boughs could be attached. Thus the source of the terrific howitzer fire from the Island Kintei, in the River Yalu, when the guns and trenches of the Russians were overwhelmed, was absolutely invisible to the latter.

Telescopic Sights.—Objections were urged by the Japanese artillery officers against the use of telescopic sights, which were not attached to their guns. They were said to be useless when fog or smoke prevailed, but such conditions must lessen the value of artillery fire at any time. The cost of such appliances was also quoted as an objection, but this is an argument that can hardly be sustained. Others laid stress on their supposed tendency to favour long range firing, and so to lessen enterprise in closely following up and supporting infantry. The Japanese gunners, however, are as little likely as those of any nation to be influenced thus adversely.

Horse Artillery.—The Japanese had no horse artillery, and they failed in consequence to reap the proper fruits of victory. Pursuit of the beaten enemy devolved upon their infantry, exhausted by continuous days of fighting, and the benefit they would have derived from fresh Reserves and mobile artillery was manifest after most of their victories.

Wooden Mortars.—The Japanese made large numbers of wooden mortars in their Dalny workshops, and used them in their advanced trenches. They were thus constructed. A pine tree log, four feet long and about twelve inches across, was sawn longitudinally, and each half was gouged out so that when the halves were brought together and lashed around with cane, in the use of which the Japanese are proficient, a hollow cylinder, which would admit a four inch bomb, was constructed. A wooden breech-block was then cut and recessed so as to receive the end of the wooden cylinder, and into the base of the latter a radial vent-hole was bored. The mortar complete weighed 70 lbs., and could be carried by two men. Fired at an angle of 45° it would throw a projectile 400 yards with a propelling charge of 2 ozs. black powder. The bombs were loaded with H.E., armed with time fuses, and when exploding in a trench created much noise, smoke, and dust, while bodies of wounded and dead men were seen by a military attaché to be hurled to a distance of many yards. It may be worth our while to experiment in this direction with light steel or aluminium portable mortars.

Hand Bombs.—Hand bombs were much used by both combatants. Those of the Russians were spherical and fired with percussion fuses. Those of the Japanese were made

in large quantities at their Dalny workshops from old provision tins. They were cylindrical, 8 inches long and 2½ inches diameter, loaded with H.E., and fired with time fuse burning seven seconds only, so that the Russians might not have time to return them. Their shape enabled them to be thrown to a greater distance than those of the Russians, and a range of 30 to 40 yards is said by one of the military attachés to have been often obtained.

Roller Bombs.—The Japanese also similarly made roller bombs. These were cylindrical, mounted on two wooden wheels 12 in. in diameter, connected up with wires by which they could be fired electrically, and could be pushed 30 yards with long bamboo rods from behind cover towards the Russian trenches. A military attaché saw successful experiments with these at Dalny, but did not see them used in actual service.

Flags and Telephones to Direct Fire of Guns.—Flags were used by the Japanese to direct the fire of guns, and were waved from an observation station on a neighbouring height. The signals thus given were very limited, being confined to "Right," "Left," "Over," "Short." Visual signalling indeed is almost unknown, both among Russians and Japanese, and it is strange that in this art the Japanese were not more advanced. Telephones also were used, but were not always audible in the din of battle, and the overhead and ground wires leading from them to the batteries were frequently broken down by passing troops. (Report of military attaché.) Evidently the introduction of the telephone, valuable though it be, has not done away with the necessity for good instruction in the various modes of visual signalling.

Shields to Guns.—Shields to guns do not seem to have been much employed by the Japanese, although some of their officers admitted that the moral and physical support which they would have afforded by sheltering from shrapnel would have proved valuable. They doubted, however, if the additional weight thrown upon the horses would not have counterbalanced their advantage, but it cannot be conceded that the weight of shields would have prevented guns from moving at the very moderate speed of infantry. Captain Vincent, however, notes that Japanese gunners of their own accord extemporised wooden shields, and that the men valued them highly.

Machine Guns.

These were not used by either combatants as with us. They were usually grouped into batteries of eight guns, and the Japanese officers placed high value upon this method of employing them. The problem, therefore, remains with us unsolved as to how best to use these weapons. Russian reports speak in glowing terms of their efficacy, observing that in some cases they were even better than artillery. The chief advantages claimed for the weapon are:—

1. That they can be rapidly placed in positions inaccessible to artillery.
2. They are easily hidden.
3. They range quickly.
4. Their fire is overwhelming.
5. They can follow up a moving target.

With the Russians the war strength of each machine gun battery comprised 5 officers, 85 rank and file, 37 horses, 8 machine guns, and 8 S.A.A. 2-wheeled carts, carrying in all 36,000 rounds. On each machine gun was also 1,350 rounds. At the beginning of the war the guns were mounted on high wheels, which are said by Major Balck to have favoured the heavy loss sustained by them at the battle of the Yalu. Later the Russians substituted a low standing tripod with shields for the former mounting, and with good results.

Rifles and S.A. Ammunition.

The rifles used by the combatants were mostly clip-loaded, and the small projectile (about ·256) which the Japanese employed proved quite enough to stop a man and put him for the time being out of action. The Japanese at times would use their weapons as single loaders. It was found that the severe cold of Manchuria caused rifle oil as ordinarily used to congeal and clog the breech action, so a vaseline preparation was employed with good results. It was observed that the reduction in size of the projectile enabled an increased number of wounded men to rejoin later on the fighting ranks, but it also enabled the Japanese soldier to take from 200 to 300 rounds into action—an important factor in deciding an issue. The value of this may be gauged by a remark made by Soloviev concerning expenditure of S.A.A. at the battle of Liao-yang, where his regiment fired an average of 600 rounds per man! The consumption of ammunition required the bringing of all the regimental S.A.A. carts into what he terms the "fighting train." Cartridge boxes when opened melted away as though by magic, and so rapid and sustained was the fire that the stocks of the rifles became charred and the bayonets softened.

Bayonets.

It is noted by a military attaché that the Russians carried fixed bayonets on the march, and this proved a source of danger to mounted men in their neighbourhood, some of whom were blinded by unexpected movements of infantry men alongside. It was also observed that the Japanese dulled or browned their weapons and thus prevented tell-tale glitter. An unexpected difficulty is pointed out by Captain Soloviev in regard to the Russian bayonet, which became at times so heated under the heavy magazine fire at Mukden as to lose its temper and bend, so that detachment was needed to enable fire to be maintained. All that appertains to the bayonet and its use and value in the final assault demands our attention. That Continental critics have not failed to observe its moral and decisive value is evident from a report in the *Neue Militärische Blätter* of an inspection of cadets in the Berlin Gymnasium by the German Emperor during May, 1906. In addressing the students His Majesty dwelt on the value of the weapon, its influence on the *moral* and hardening of the soldier, and indicated that it should in future be largely resorted to for training purposes. There is reason to fear that our infantryman will be placed at a disadvantage from the shortening by five inches of his rifle, unless we place him on an equality with his possible foes by lengthening his bayonet. The new short Lee-Enfield rifle (pattern 1903) with bayonet attached is just fifteen inches shorter than the French Lebel rifle and bayonet, thirteen inches shorter than the German Mauser and bayonet, nine

inches shorter than the Japanese rifle of 1900 with its bayonet, and twelve inches shorter than the Russian Nagant rifle and bayonet. As compared with the Japanese and Russian weapons, its weight is but five ounces and eight ounces less respectively. It should be considered whether the handiness which will come from this small diminution in weight will compensate for the lessened reach, and the value both to Regular and Auxiliary troops of systematic training and competition in bayonet exercises is very manifest. The Russians are condemned by a French expert for devotion to their bayonets to the neglect of their rifles. Wisdom would seem to claim proficiency in the use of both weapons.

Swords.

The Japanese officers carried swords in brown leather scabbards to render them less conspicuous; but it was noticed that the officers could be easily picked out through binoculars at 1,000 to 1,500 yards by the contrast between this scabbard and a yellowish cloak which they sometimes wore. The Russian officers slung their swords from the right shoulder in a useful way, so that the left hand was not occupied in holding the scabbard. Captain Soloviev is of opinion that to the officer a rifle and bayonet is essential. He points out that the revolver cannot as a rule be reloaded during the assault, and that the sword is no match for the bayonet. Russian officers were seen to arm themselves thus in the moments preceding an assault. Previously they had confined themselves to the exercise of control and command, but at the last moment they would snatch a rifle and bayonet from a dead or wounded man.

Infantry in Defence.

Captain Soloviev, in the *Revue Militaire*, and General Négrier, in the *Revue des Deux Mondes*, give detailed accounts and luminous criticisms of the work done by infantry in the Manchuria War. The former was on active service throughout the war, and the position of the latter enabled him to collate reports from all sources. In the opinion of General Négrier, the Russians owed their undoing to the unenterprising way in which they clung blindly and without knowledge to their prepared positions. Strong indeed these were and strongly were they held, as at Liao-yang, when the Russians had a preponderance of 30,000 men, and at Mukden, when they had many more than the Japanese. In this last engagement, the most stupendous, perhaps, that the world has ever seen in regard to numbers, extent, and duration, all the resources of field engineering were employed to strengthen the Russian position. The latter brought into action 380,000 men, and they fought for 14 days on a frontage of 100 miles. With infinite labour they had constructed large redoubts with wide and deep communications, wire entanglements, electric and automatic mines, roads from front to rear, epaulemetns for batteries of field and siege guns, depôts for ammunition in their trenches, a railway running from west to east of their position, telephonic communications, searchlights and high observation towers. Nothing was omitted which could tend to repel an attack, yet the result proves the truth of the military axiom, that "there is no position so strong that it cannot be turned." Attacked in front for 12 days they held their own, but when attacked

by Nogi's army on their right flank, with their communications cut to the north of Mukden, they were forced into disastrous retreat, losing 160,000 men in killed, wounded, and prisoners. Again, at an earlier stage of the war, when the Japanese attacked the Russians who were astride upon the isthmus leading to Port Arthur, the above axiom was demonstrated to the hilt. The frontal attack had failed, but the enterprising Osaka Division, supported by fire from Japanese gun-boats, turned defeat into victory by wading waist-deep through the sea on the Russian left flank, and threatening their communications and line of retreat. It is well said by Captain Holbrook in the *U.S. Magazine* that no commander on the defensive should rely over much on the terrain for invulnerability. Though his defence may be as obstinate as that of the Russians, it may fail him when attacked by an enemy who moves and fights by night and lies hidden in entrenchments by day, and, moreover, the defence of his flanks and rear may at the last collapse. The Russian commanders were influenced by traditions of an older school. The *rôle* which they adopted was to hold their lines strongly, exhaust their assailants, and then hurl themselves upon them in a crushing bayonet attack. The fallacy of this is demonstrated by General Négrier, who declares that they carried the cult of the bayonet so far as to be unable to profit by the teaching of the past. Their leaders would urge their men to rely mainly on that weapon, and they were inspired by the teaching of "Suvaroff" that "the bullet is foolish, the bayonet only is wise."

These lessons may be drawn from defensive operations in the campaign:—

a. Passive defence must be associated with active counter-attack—without it, given time and numbers to the assailants, the defence must fail.

b. The general Reserves must be mobile, and to obtain this the troops must be mounted, so that they may move at a pace of at least 5 miles an hour to the threatened flank.

c. Trenches must be narrow and deep, not wide and shallow as with the Russians, so that proper protection from shrapnel fire may be secured.

d. Trenches must be thinly lined until the last moment, and advantage taken of the effectiveness of modern magazine rifle fire. The Russians were always haunted with the idea that their front would be broken, and so packed their men too thickly into their trenches. Thus they suffered over much from artillery fire, needlessly exhausted their men, and diminished their Reserves, which should have repelled turning movements or made counter attacks.

e. Thorough training in extended order and independent firing is essential. The Russians neglected the former and used volley firing over much. The closeness of their formations caused heavy losses, and modern wide dispersions make volleys impossible. General Négrier comments thus upon the counter attack carried out by General Stakelberg on 15th June, 1904, at the battle of Wa-fang-kou:—"The line of attack advanced by sections, which

were formed into dense lines of skirmishers, who stopped and fired volleys from time to time. Such, however, were the losses in a few minutes that this field-day style of tactics was abandoned."

f. It reads as a truism to say that reconnaissance is essential to the safety of troops on the defensive, yet the Russians neglected this, and we see their Reserves exhausted by aimless marching from flank to flank, as when during the battle of Mukden the 1st Siberian Army Corps moved by forced marches 50 miles to the E., and then was hurried back over 75 miles to the right flank. This arose from Kuropatkin's ignorance as to the direction of the blow which his enemy was about to deliver.

Throughout the campaign the *rôle* of Russia was to await the assailant in its prepared positions, as at the Yalu, Nanshan, Liao-yang, and Mukden, and to retreat when the turning movement was pressed home, a monotonous record of failure for which some explanation has been attempted in the preceding paragraphs. The function of Japan was to attack, and light is thrown upon the causes of their success by the remarks of the Russian officer who took part in the struggle, and of the French critic who studied the reports of the military experts. Captain Soloviev paints vividly the daily incidents of the camp and battle-field, and General Négrier draws broad conclusions from the abundant *data* before him.

Infantry in Attack.

The following are the points connected with the infantry attack on which these observers lay most emphasis:—

a. The Japanese soldier goes light into action. His knapsack is left behind, and he takes only his rifle, bayonet, and ammunition, rations and water, entrenching tools, and *tente a'abri*.

b. A light canvas tent is absolutely needed by men who may be exposed to all weathers for days together in open trenches, in which they may have to sleep, eat, fight, and die.

c. Japanese troops in the attack would march during the night and dig trenches under cover of darkness, in which they could lie hidden by day. Thus there was reason for the remark of a Russian that "though the firing line came nearer daily they never saw an enemy."

d. Portable iron shields were carried by the Japanese and used as shelter for the men who ran out to cut wire entanglements. The Russians used such to strengthen the parapets of trenches and to provide loop holes.

e. The value of entrenching tools was recognised by both sides. Captain Soloviev complains that the supply of shovels was insufficient. His company started with 40 per cent. thereof, but at Mukden in October, 1904, there were ten only remaining, or 5 per cent. The Japanese used their spades freely, and a note by Colonel Mura of the Japanese General Staff, in the

JOURNAL OF THE R.U.S.I., is instructive. "In the firing line," he says, "one fires while another digs—the rifleman is immediately followed by a sapper. We work in a manner distinct from that of other armies. Our agile soldiers dig while lying down, and excavate without being seen in the most advanced positions, so that succeeding files find a shelter already made for them. The Germans work with the spade only at night, when they can stand to dig. We, in addition, dig lying down and entrench ourselves during the day time, so that our enemy in front, though he may be superior to us in numbers, can do nothing to us without artillery." It has been said that the advance may be checked by encouraging entrenchment, but it is not reported that the brave Japanese troops ever refused to quit cover at the call of their officers.

f. The Russians found that the Reserve rations needed close watching. The improvident men were apt to consume them on the first opportunity, even after a good meal.

g. The Japanese worked much by night. The darkness sheltered them from hostile artillery, and luminous discs and compasses were freely used. The need for keeping touch compelled them at times to bring their lines dangerously close to each other, as at the night attack upon Three Rock Hill. A military attaché reports that in this instance the front line consisted of six battalions extended to single rank, shoulder to shoulder, and were followed at a distance of only 50 yards by the second line, composed of seven battalions in line of column of companies at 50 yards interval. Much loss would have resulted had the firing of the Russians been directed lower, and it was suggested that it would have been useful to the latter if they had previously stretched a strong wire in front of their trenches a few inches from the ground, so that the muzzles of their rifles might have been kept down when replying to the night attack. Portable search-lights were used by the Japanese during their night attacks, and enabled their artillery not infrequently to co-operate with their infantry.

h. Artillery fire was continued by the Japanese to the last moment of the infantry attack, and large white flags with red centres were carried by each battalion in its firing line to guide the gunners. Small flags were carried by each company to mark the rallying points after an assault.

i. The danger of assaulting with exhausted men was shown at 203 Metre Hill, and the final success was only obtained when fresh reserves were brought up to complete the work.

j. The shooting on the Russian side was bad, though they handled their spades and bayonets effectively. General Négrier points out that the Boers used their rifles and spades well, the Russians their bayonets and spades, while the Japanese were good with all three, and this, he says, contributed to their success.

k. The infantry movements within the zones of artillery and rifle fire are very noteworthy. The Russians suffered much loss from moving in close formations, but the advance of Japanese troops was more in accordance with modern principles, and the experience of Captain Soloviev convinced him that swift punishment waits upon the troops whose advance does not accord with the latter. In his opinion, infantry should move in column of route until they reach the zone of artillery fire, then, by carefully hidden movements of small parties, which should be in single file with ten paces between men, if concealment from the enemy's guns be not possible. Before entering the zone of infantry fire, both firing line and reserves should deploy under cover. In his opinion there should be no supports. Their place, he says, is in the firing line, which should be thickened as rapidly as possible, so as to establish fire superiority as soon as possible.

l. The devotion and determination of the Japanese attack cannot be praised too highly. Though each man counted his life as naught, there was no blind self-sacrifice, for cover was used whenever possible, and the spade freely employed. Stern resolve to push home the bayonet charge was manifest, and this it was that carried the Russian trenches, and without it the Japanese artillery preparation and the bad shooting of their enemies would not have availed them.

m. Good shooting was made by Captain Soloviev's company at the long range of 2,500 yards, and much inconvenience caused thereby to a Japanese battery. He holds that troops should be trained in firing at long ranges.

n. The value of fire control was admitted by all, as it has been in the past. The din from rifles and bursting shells prevented Captain Soloviev from communicating with a man into whose ears he shouted, and thorough training during peace in obedience to whistle and hand signals is, he considers, the only way in which the commander whose company may occupy 400 yards of frontage can control his men. It is the *sang froid* of the officer which steadies the men in the heat of combat. They take their cue from him, and Captain Soloviev found it useful at times during a lull in the fight to sharply call the attention of his section commanders to such matters as the proper adjustment of sights, or to some small point of discipline.

o The Russian bayonet was designed for thrusting; the Japanese used theirs with a downward slashing movement. It is important to decide which is the more effective, and which is the best form of weapon.

p. The importance of rifle fire was demonstrated. Of the total casualties, 85 per cent. are said by Captain Soloviev to have been caused by infantry fire. It becomes, therefore, the more necessary to maintain the efficiency of the rifles by supplying a large reserve of weapons to replace those

which soon deteriorate in a campaign through wear, rust, and accident, and the value of musketry training is made manifest.

q. The consumption of small-arms ammunition in a modern battle is enormous, as at the battle of Liao-yang, when the 1st Siberian Regiment fired 1,200,000 rounds; nor is it, in Captain Soloviev's opinion, possible or desirable to limit or lessen this, because the defenders, with no visible target to fire at, can only prevent their enemies from advancing by literally covering exposed areas with a sheet of lead. The best method of supplying the firing line is, therefore, a problem still awaiting solution.

r. In order to provide infantry escorts to the guns, the Russian battalions were often depleted, but later it was found more useful to permanently attach infantry companies to the batteries. Thus they became more versed in the work of protection, and moreover could become trained in the duty of filling gaps among the artillerymen.

s. During the night attacks the Russians lost many men through such slimness on the part of the Japanese as our men suffered from when fighting the Boers—Captain Soloviev on one occasion losing heavily when his company approached a Japanese trench from which some one had called in excellent Russian: "Come on, brothers, we are all Russians here."

The British and Japanese Attack Compared.

Major Balck, the German military critic, comments adversely upon the so-called British reluctance, as shown in South Africa, to push home their frontal attacks and to "stake all on the last throw" when the fight hung in the balance. This, he says, comes from that over-carefulness of their men's lives which paralyses our commanders. He urges that frontal attacks are not only unavoidable, but necessary. That commanders must not spare their men, but should remember that the sooner a preponderance of fire is established and the longer the artillery is able to pour in an effective fire, and thus support the infantry attack, the more the losses will be minimised. He considers that the Japanese success came from their throwing overboard the teaching of the British school, which is adverse to frontal attacks, and dwells over much upon the difficulty in advancing across open ground. The tenacity of the Mongols eliminated all indecision, and when once launched to the attack he says that "they pushed doggedly forward like angry bull dogs, never halting until, bleeding and exhausted, they had fastened themselves on the enemy and won the victory." Caustic though the foregoing be, yet some lesson may perhaps be taken from the opinion of our German critic, who thus sums up the principles on which the Japanese conducted their attacks:

1. Their infantry advanced and their artillery deployed under cover of darkness.
2. Their infantry and artillery co-operated along the whole front of the enemy.

3. By feints the enemy was made to send his reserves to some spot other than where it was intended to make the decisive assault.
4. The decisive assault was delivered unexpectedly and pushed home.
5. By avoiding pursuit they avoided falling into traps. Probably, however, it was the absence of mobile artillery which prevented them from consummating their victories.

Outposts.

It was not usual with the Japanese to appoint any one officer to command the whole of the troops on outpost duty, since it was feared that he might be tempted to unduly weaken one part of the line if threatened elsewhere. Each section, therefore, was held by one battalion under the C.O. thereof, who was responsible only for his own section. They were accustomed to place their sentries and pickets a few yards below the crest of a hill on the reverse slope, so that an approaching enemy might be defined against the sky-line.

Communication by Connecting Files.

In this the Japanese were most assiduous. Perhaps more skill and energy were thrown into the work of connecting files and the verbal passing of messages owing to the marked absence of various methods of visual signalling, and a firing line was often seen to be connected up with its supports by a chain of men placed 25 yards apart. The Ideographic nature of their language made it easier to transmit messages over short distances by word of mouth, but for long-distance signalling this was quite useless. The absence of effective visual signalling among the Russians was badly supplemented at Vafango, when Stakelberg, whose right flank was turned, ordered General Gerngross, in command on the left of his line, to retire, and sent his order by mounted orderlies, who occupied the best part of an hour in covering the 3½ miles which separated the commanders, whereby the Russians sustained heavy needless loss.

Clothing and Equipment.

Russian troops wore a linen khaki jacket in summer which, though cool by day, proved cold and damp at night owing to rapid evaporation. Later, a woollen garment was served out to be worn under this with good results. The Japanese used a blue cloth cylinder, 7 feet long and 8 inches across, hung over the left shoulder and crossing chest and back diagonally. The ends were tied together, and he front part being empty so as to avoid hampering the use of the rifle, the back part was filled with food, cartridges, etc. They also used a brown haversack suspended from the shoulder, hanging over the hip, and hooked to the belt, so as not to sway about when the man stooped or lay down. In this were carried the day's rations, writing materials, and field dressings. The men also carried blackened aluminium water-bottles, which were more useful than those of wood or vulcanite, being unaffected by boiling water and readily cleansed, though injuriously affected by hot soda and water. In the early days of the war the conspicuous dark blue uniform worn at the crossing of the

Yalu was too clearly defined against the yellow sandy back-ground of the river channel, and led to unnecessary loss. Later on they appear to have realised more fully the importance of harmonising the colour of clothing with that of surroundings, but this was certainly a difficult task when they were fighting at one time over light sand and later on amid the green maize crops of Manchuria.

Organisation and Drill.

The Japanese company at war strength contains 250 of all ranks, including a captain and three subalterns, and is divided into three sections. Four of such companies form a battalion commanded by a major with an adjutant and sixteen company officers. Thus it compares unfavourably with our battalion, which comprises 28 combatant officers. In the assembly and manœuvre formations the three sections of a Japanese company are on parallel and successive alignments, distant six paces from each other. The company when moved to a flank forms fours automatically, and if attacked by cavalry from the front both ranks of the leading section kneel to fire, and the second section closes up, both ranks of the latter firing standing, while the third section protects a threatened flank. Whistles and hand signals are used to move the company, but flag signalling, as before remarked, is not much used to transmit messages. Captain Vincent notes that it was customary with General Oku, who commanded the 1st Army, to which he was attached, to send one of his staff officers to the Headquarters of each of his divisions, and thus to ensure that his orders were carried out in the spirit in which they were issued. This also ensured co-operation among the divisions, and worked excellently with a minimum of friction owing to the selection by the army commander of tactful representatives.

Secrecy and Concealment.

The Japanese proved themselves adepts in the ruses of war, and compared to the disadvantage of the Russians, whose plans were more or less authentically forecasted in all the European newspapers, and also, perhaps, with ourselves, who published to the world our intention of attacking Spion Kop five days before we actually did so Correspondents and attachés were alike under surveillance, and a strict censorship was exercised over the written communications of both. From officers of all ranks but scanty information could be gleaned, and all this, without doubt, tended to thicken the fog in which the Russian commanders moved. The elaborate pains taken to hide the disposition of their troops was well shown when the 1st Army moved down the south bank of the Yalu. It is recorded by General Sir Ian Hamilton that to prevent the Russians on the north bank from counting their guns and men they screened the road with a vast number of green fir trees cut down at night and stuck into prepared holes with wire-supporting stays from tree to tree. A suggestive hint as to the need for restraining the irrepressible correspondent is given quite unintentionally by a newspaper correspondent, who, as a *persona grata* with the Russians, was allowed to ride with Colonel Plaoutine and his Cossack force, which raided across the Liao River into Chinese territory, ostensibly to learn if the Kupanze Tsinmintun-Railway was carrying contraband for the Japanese. In reality their mission was to

work to the south round the left flank of the Japanese, cut their communications and burn their stores. "I suspected," says this correspondent, "that a deeper object lay behind the ostensible objects of the expedition, and I at once wrote to the *New York Herald*, saying, that the real aim of the Russians in making this raid was to reconnoitre the extreme left of the Japanese with a view to sending Cossack expeditions to cut the railway south of Liao-yang." It needs not to say that Colonel Plaoutine's expedition failed. Colonel Haldane draws attention to the fact that all Japanese troops, save the Guards, were dressed alike. There were no tell-tale badges or buttons to indicate the regiment to which the owner belonged. Their sentries were so much on the alert that it was not infrequent for a military attaché to be arrested and detained as a Russian spy. From the Japanese prisoner neither kindness nor severity could extort information, though the less subtle Russian was apt in his cups to give away secrets to his captors. Colonel Haldane notes that at Mukden a whole division was withdrawn from the fighting line and transferred to the reserves without the Russians having knowledge thereof; and this, though the withdrawals were made during winter nights over ice bound roads. At a later stage of this battle the 3rd Army appeared on the right of the Russians, who had been led to believe that it was about to attack their left.

Balloons.

These were used by the Russians, and to a less extent by the Japanese, though the latter attached value to the information obtained by their use. At the battle of Liao-yang on 30th August, 1904, the Russian balloon was able to report the impending Japanese turning movement on the right flank, and at the same battle the Japanese admitted that had they been provided with a balloon they would have been saved the useless expenditure of 1,000 rounds of shrapnel which they wasted in indirect fire upon non-existent infantry reserves.

Engineers and Bridging.

With the Russians bridge building was well done. Their engineers would rapidly construct long trestle bridges across wide rivers, over which trucks would be drawn by stationary engines. If the river were not too deep and rapid they would place heaps of rocks in close proximity to each other, and on these rest strong wooden beams, to which the sleepers were spiked. The Japanese also showed great skill in bridging by night the rapid Yalu, the branches of which, when too deep for trestle bridges, were traversed by pontoons. Construction was at times prolonged into the hours of day-light and under fire from Russian guns on the north bank, but as a rule the work was done under cover of darkness.

Cycling Troops.

No fresh light upon the use of the cycle, whether foot or motor propelled, has been contributed by the Manchurian campaign. As might have been anticipated, the Russians, who have no experience of the mobility given to infantry mounted on cycles over good roads such as exist in this island, have relegated the cycle to the work of

the despatch rider. It is laid down in the "Handbook of the Russian Army, 1905," that each regiment shall possess two cyclist orderlies, and that they shall be strong, intelligent men, armed only with revolvers. Doubtless the bad roads of Corea and Manchuria would have destroyed the mobility of any cyclist force, and hence the recent regulations of the Russian Army have not provided for the establishment of such.

The Medical Service.

In few departments have the Japanese shown more intelligence than in their adoption of and improvement upon Western principles of hygiene—personal cleanliness with daily washing of the body was practised whenever possible by all ranks, and it is noted by a war correspondent that it was possible to march to leeward of a column of infantry on the hottest day without suffering inconvenience. Before going into action it is reported that the crews of fighting ships washed and put on clean clothing, so that no septic matter might be carried into a wound. The men were taught to keep their nails closely pared, their feet were diligently looked after, all refuse of the camp or bivouac was punctually destroyed, and every precaution was taken to prevent excretæ of men and horses from polluting drinking water. The latter was always boiled when the medical department considered it needful, and before embarkation upon their transports the men were prevented for three days from taking alcohol in any form in order to prevent sea-sickness. Attention such as this to the many matters which go to sustain the efficiency of an army caused a wonderfully small percentage of enteric cases and rapid recoveries from gun-shot wounds. The staple diet of rice was convenient in many respects. It was portable and easily cooked, but some medical authorities attributed the severe beri-beri, which caused much destruction to the Japanese, to their being restricted to this almost purely starchy dietary, and it is said that the disease lessened when wheaten food was employed. Interesting notes are published by Major Balck in the *Militär-Wochenblatt* concerning the wounds caused by artillery and rifle fire. The former caused more severe laceration, and were more fatal than the latter, owing to the inflammation resulting from dirt and clothing driven into the tissues. Recoveries from what would seem to have been most severe rifle wounds were quite marvellous. Men would recover and return to the front after perforation by the Japanese small high-velocity projectiles of the bladder, intestines, lungs, and even the brain. A corporal of the 36th East Siberian Regiment, who was shot through the lungs started for the railway station on a bicycle, but feeling uncomfortable he preferred to walk the remaining 18 miles. Bayonet wounds, being usually infected, were not so amenable to treatment. Comparison of the hygienic condition of the Japanese field armies with that which prevailed among our troops in their recent South African campaign suggests that we have yet very important lessons to learn and apply in order to maintain efficiency in our next contest. The Japanese in their recent war lost 57,000 from wounds and 15,000 from sickness, the deaths from sickness being less than one-fourth the total loss—a proportion without parallel in the records of war. In our South African War there were admitted to hospital 18,000 for wounds against no less than 400,000 admissions for the treatment of disease, so that for every man admitted to hospital

wounded there were 22 admissions for sickness. Of enteric cases we had 41,000 against the 193 sustained by the Japanese during their campaign. How may this be accounted for? Doubtless by an appreciation and intelligent application of the laws of hygiene on the part of our allies. Their bacteriologists have taken a high place among the world's scientists, and not in vain have they laboured. It would seem from communications appearing in our medical papers that the Japanese have anticipated the suggestions of Major Goodwin, R.A.M.C., contributed by him to the JOURNAL of the R.U.S.I. (June, 1906), for the improvement of the sanitary conditions of our own Army. By him two measures are specially advocated, and when one considers how grievous in the past has been the loss to our mobility and efficiency from purely preventable causes, one cannot but endorse his teaching. He would create a sanitary organisation and train a selected corps of officers and men in matters of sanitation and disease prevention, thus relieving the R.A.M.C. of a task which their other urgent duties prevent them from doing any sort of justice to. In addition, he would secure the co-operation of all ranks by educating regimental officers and men in sanitary principles, and it should be brought home to all that dysentery and typhoid may be stamped out, as in Manchuria, by use and supervision of proper latrines, protection of food from germ-bearing dust and flies, and the sterilization of impure water. Flagrant offences against sanitary laws should be punishable under military law as not only being injurious to the offender, but as lessening the fighting value of the force, and thus that luke-warm assent to sanitation which now prevails would be replaced by a strenuous co-operation of combatants and medicals.

CAMPS AND BIVOUACS.

The Russians carried shelter tents, which could be rapidly put together, and consisted of a few water-proof sheets, each 8 feet square, one of which was carried by each man. They were not, however, skilful in selecting sites for their bivouacs, which were often placed in the damp lands at the bottom, instead of being on the better drained slopes of the hills. The Japanese infantry also carried small *tentes d'abri*, without which large numbers would have succumbed to the rigors of the Manchurian climate.

SUPPLIES.

The Russian troops were badly fed. From the Chinese natives, who regarded them with no friendly eye, supplies were obtained with difficulty, and the Russians, to their loss, estranged the inhabitants needlessly by remissness in payment for what they obtained, and by using as fuel the drinking troughs of their animals. The Japanese, on the contrary, were well fed. Owing to their command of the sea their supplies came into the country without let or hindrance, and so well was this done that fresh fish was sent daily to their troops from fish ponds constructed at Dalny in which live fish were stored. The feeding of an army in the field is certainly one of the most important problems to be solved, and our South African experience suggests that the efficiency of a force which subsists largely upon hard biscuit and tinned meat, is apt to be impaired. It may be that in the future it will be necessary that depôts for cold preservation of recently killed meat

should be established as the army advances, and that thence supplies should be forwarded on rapidly constructed light railways, which could be laid down *pari passu* with the advance.

Cooking.

The Russians used excellent travelling ovens on two wheels drawn by one horse. These went wherever the troops could go, and cooked while on the journey, so that hot meals were ready for the men on completion of their march.

Orders and Messages.

The importance of duplicating these in writing was proved by the frequent mishaps in their transmission which occurred among the Russians. Insufficient care was exercised by their officers, who would often give a verbal message to an unintelligent orderly without troubling to ascertain if he understood it or could repeat it correctly.

Roads and Communications.

The Manchurian roads were extremely bad. At all times movement of troops must cause much wear and tear, but the Russians took no proper steps to repair their lines of communication. Deep and dangerous mud-filled holes accumulated, and in the wet season the mud was so deep that the men would march with bare feet to lighten their labour. Thus all calculations as to time were upset and unnecessary fatigue and confusion were caused. To a large extent the bad roads accounted for the imperfect manner in which distances were kept by Russian troops on the march.

Topography.

The country to the north of Liao-yang was to the Russians, in a military sense, *terra incognita*. They seem not to have troubled to map it efficiently, and as the result their combinations miscarried in the later stages of the campaign. The country to the south of Liao-Yang, as far as Port Arthur, was well mapped, and we may infer that they expected to be able to confine hostile operations to the latter district. The need for thorough instruction of all ranks in road mapping and reporting is one of the useful lessons to be learned.

Telephones and Telegraphs.

The very considerable use made of these instruments in this campaign is a striking feature. At the Yalu battle each stage was hourly reported by wired and wireless telegraphy to Tokio. Later we find divisional commanders communicating with their brigadiers and directing telephonically the progress of the conflicts. In the direction of indirect artillery fire the telephone proved valuable. From some high observation post on the top of a distant hill the battery commander was thus informed of the results of his practice at reserve infantry hid len under a sheltering hill or at the Port Arthur buildings and war vessels. For dramatic interest it is difficult to rival the part played by the telephone at the Port Arthur siege. In a bomb-proof shelter

cut into the hillside sat General Nogi, two miles distant from the fort which was to be assaulted, with wires radiating to similar shelters in which were his divisional commanders and the chief of his artillery. At his order fire opened from 500 guns. When he commanded through the telephone they were silent, and 20,000 infantry were launched to the assault. Aids and gallopers, lamps, heliographs, and flags were rarely seen, but the telephone carried information collected by all to one central mind, and thence issued silent orders which moved harmoniously the attacking troops. Doubtless, also, the lessened use of visual signalling elsewhere referred to came from the increased use of telegraphy and telephony.

Lines of Communication by Land.

The scope of this paper allows only a passing reference to this interesting topic. The Russians communicated through 4,000 miles of single rail, which, by its insufficiency, no doubt contributed to their defeat. Yet insufficient though the Trans-Siberian Railway may have been, the good work done by it falsified the predictions of those who foretold its speedy collapse under the stress of war. Under the able management of Prince Khilkoff, the Minister of Ways and Communications, it proved equal to conveying 30,000 troops per month to the seat of war, and through trains from the West to Irkutsk, near Lake Baikal, increased from six in the 24 hours in January, 1904, to twenty in a corresponding period in the autumn of the same year. Nor was it interrupted by the enemy, and its bridges and culverts remained unbroken. This goes to show the superiority of the rail over other methods of transport. Further evidence of its value may be found in the short-lived damage done by Mishchenko's cavalry raid to the rear of the Japanese left, near Niuchwang, when he broke up some 500 yards of their railway, an interruption which was made good in two days. This also suggests that a cavalry razzia on a large scale, with a view to destroying a line or telegraph system, meets with less success than if the attempt be made to destroy bridges and junctions by a small patrol moving by night and hiding by day. Also it suggests that the Japanese had not adopted that mode of guarding their rail, which proved effective with us in South Africa, *id est* small posts at intervals of ten miles and also at bridges, with flying columns having easy access to threatened places, and armoured trains patrolling by day and night.

Value of Sea Command and Timely Preparation for War.

The Japanese demonstrated the value of sea command by pouring into Manchuria an uninterrupted stream of men and supplies, and the devotion of their naval officers and men had its reward in that they crippled and destroyed the Russian fleet. Hence they could establish a base for supplying their armies at any part of the coast which suited them, and we see them, as their Corean Army moved northwards, successively landing supplies at Chemulpo, Chenampo, and Antung, and so reducing the weary length of the Corean lines of communication. But though Sea Power is of primary importance, it is not in itself sufficient to save a nation and destroy its enemies. The Japanese could protect their own islands and keep open their lines of sea communication to the Manchurian coast; but had not

their army been what it was they could not have driven the Russians out of Corea, Port Arthur, and Southern Manchuria. The need, therefore, to England of an army both efficient and large is clearly indicated, and the Blue Water School, which cares little for a "Bulwark" other than our ships, should remember that what happened to Japan may happen to ourselves. Within a short half-hour she saw one-third of her fighting strength in battle-ships sent to the bottom, when the "Hatsuse" and the "Yashima" were struck by floating mines. Those who rely only upon our first line of defence to the neglect of our land forces would do well to note that the Russian fleet was so blockaded and checked by mines and torpedoes that it was powerless to prevent Japan from throwing a division comprising all arms upon the Corean coast between 8th February and the end of March, 1904. They should also observe that the rapidity with which the wheels of modern warfare move leaves but little time for the training of troops after a declaration of war. Diplomatic negotiations at St. Petersburg were broken off by the Japanese Minister on 6th February, 1904, and on 8th February the Russian "Koreetz" was attacked by torpedo boats, and with the cruiser "Variag," was destroyed by Japanese war vessels on the following day.

Political and Social Conditions Bearing on the Campaign.

The Japanese, though only lately emerged from the despotism of feudalism, are in happier plight than the Russians. The latter are ground beneath the iron heel of a military despotism, with their Czar as its figure-head, whom they venerate with much lip-service, but from whom the sympathy of the masses has been greatly alienated by revolutionary intrigue. The Japanese serves his Mikado with joyous devotion, and shows the fighting traits which exalt the willing over the unwilling conscript. Whether this will be lessened by longer cultivation of the arts of peace must be decided by a generation subsequent to our own. McCullagh predicts in his "With the Cossacks" that their prosperity will increase, but their happiness will diminish. "Success will bring satiety. Knowledge will bring disillusionment. They will learn, alas! that Matsuhito is the last Mikado who is divine. Wealth and factory servitude the great corroders of martial virtue, will gradually take the fine edge off their valour."

THE STRATEGICAL VALUE OF SPEED IN BATTLE-SHIPS.

By JULIAN CORBETT, Esq., LL.M., F.S.A., Barrister-at-Law, Naval War Course Lecturer.

On Wednesday, 6th March, 1907.
Admiral the Hon. Sir E. R. FREMANTLE, G.C.B., C.M.G. (Rear-Admiral of the United Kingdom), in the Chair.

I FEEL that in approaching a subject on which so wide a difference of opinion exists amongst distinguished officers, not only in this country, but in all countries, some kind of apology is necessary from a civilian. I want, above all, to disclaim the idea even of attempting any dogmatic conclusion on the subject. I do not think it is possible for any one in my position to do more than endeavour to point out where argument seems to have gone astray in this discussion, and to point out certain lines of argument which appear to be unsound, and certain fallacies which tend to recur in all discussions of this kind. I felt it might be possible perhaps to assist by indicating where such false lines of argument and fallacies have come in, with the hope of discovering why it is that these remarkable differences of opinion exist, and also how we can best get rid of them.

I will commence with an attempt to state what the problem really is, in order to arrive at what the true line of argument should be. It is extremely important to do this, although I believe it to be an Anglo-Saxon failing almost always to approach a discussion without first having stated as clearly as possible the proposition that is going to be discussed. We are all of us inclined to do that, and the result is that we find ourselves going into a number of partial arguments which deal with only part of the case, or else are entirely off the line.

Now, in none of our British or American writers, so far as my knowledge of the controversy goes, have I found such a statement, but the moment we turn to the French writers we find it laid down quite clearly. I will take as an instance the author who writes under the pseudonym of "Michel Mérys," who is a *lieutenant de vaisseau* in the French Navy, and may be classed as an opponent of high speed. In seeking to reach a real statement of the case, he begins by eliminating from the discussion the main point on which we all agree and he starts with this postulate: that the strategical value of high speed, considered alone, independently of its reactions, is beyond doubt. I think that is a proposition on which everyone is agreed. He then considers the reactions. He tells us that they are both tactical

and strategical. The tactical reactions mean that high speed is apt to lower the capacity of a ship for gun power, armour, and the like. With these tactical reactions I do not propose to deal, as they are beyond my power, and the present purpose. I wish merely to direct your attention to the strategical reactions—the strategical reaction, I may say, for there is only one main reaction, which Mérys calls the radius of action. In other words, the strategical reaction of high speed is that it tends to a diminution of the radius of action owing mainly to increased coal consumption.

I use that old expression, "radius of action," although others have been suggested recently. I doubt whether they really help the matter. We have "Mobile endurance," "Enduring mobility," "Coal endurance," and such-like expressions, but I think "Endurance" is really all that we require—"endurance," or the old term, "radius of action."

Now, in approaching this question we ought to know whether radius of action falls in proportion to the rise of speed. Whether that has ever been ascertained accurately I cannot say, but it is wise, for the sake of our discussion to-day, to assume that it does; and we will, therefore, assume that gain in speed is always balanced by a proportional loss in endurance. When we have admitted that we are in a position to get a fairly clear statement of the question. It is this: Has speed or radius of action the higher strategical value? Or, as the French authority puts it: "Which of the two lends itself to the greater number of strategical combinations?" That is the vital question as to the strategical co-efficient of speed. There is, it is true, another which relates to the number of units. Increased speed tends to increase the size of the ship, and, consequently, to diminish the number of units. That is also a strategical question, but we will omit it, at all events for the present, because it is really so much more bound up in the question of big ships than in the question of speed.

Now let us see how English writers approach this question; I mean how our recent writers, of what I may call the moderate speed school, have approached the solution of the question. At the outset I do not think we can help noticing a marked tendency to cite cases where radius of action is clearly more important than speed, and to ignore all others. Here we have the first erroneous line of argument, this tendency to quote cases that deal clearly in one direction and to ignore all the others. Such a method does not help us at all, because each case that is cited can be met, in all probability, by a case where speed is distinctly more important than radius of action, and we get no further. You will notice in all these writers that practically all the cases they cite are cases of wide oceanic movements.

Contrast this method with that of the French authority. He sees at once that his proposition is not necessarily true in all cases. He sees there is a wide logical difference between the case of oceanic movements and the case of movements in narrow seas. Therefore, he distinctly says that his proposition with regard to the higher value of radius of action is only true for what he calls *les grandes traversées*, or wide oceanic movements, and he cites the cases of the voyages of Rodjestvensky in the Russo-Japanese War, and Cervera in the American-Spanish War. He does not even attempt to contend that

his proposition is true of operations in narrow seas. He admits that narrow seas are an exception to his rule.

Now, having pointed out the way the French officer approaches the subject, distinctly seeing the difference between oceanic operations and operations in narrow seas, let us examine more closely the way in which British officers approach it. I will quote one, perhaps the ablest, certainly the most persuasive advocate of moderate speed. In advocating radius of action above high speed he maintains that his view is supported by history, and having said that, he proceeds to justify his claim by quoting the case of Villeneuve chased by Nelson and Rodjestvensky's voyage. Without wishing to pre-judge the case in any way, I should like to submit to you that that kind of argument cannot be passed.

To support his assertion that history is on his side, he quotes two cases, both of which are absolutely without precedent in naval warfare. Not only are they without precedent, but they are both oceanic. One cannot help noticing again—I hope I may say it with great respect merely as the view of a civilian—a tendency in service discussions to found arguments on exceptional cases because they are at once the most conspicuous, the most brilliant, and the best known.

I notice that, not in a carping spirit, but as a warning against the danger. The thing that really counts, above all, in strategy is the forgotten, humdrum, every-day normal, not the brilliant exceptions; and to say that naval history is on your side because Nelson's chase of Villeneuve, or Rodjestvensky's voyage, appear to tell in your favour, is argument upon which it is not safe to rely. In this case the distinguished officer not only entirely ignores the normal, but he also fails to draw the French lieutenant's distinction between oceanic operations and those in narrow seas. If he had wished to complete his argument, after dealing with two oceanic cases, he ought at once to have dealt with two operations in narrow seas.

So much for the arguments which are logical and those which are not. Now let us admit the logical arguments for moderate speed, and see where we arrive. Well, we get to this point, that in oceanic movements, endurance is more important for strategical combinations than high speed. I do not mean to say that that is quite certain, but it is well, at all events for the present, to admit it for the sake of eliminating differences and simplifying the discussion. Therefore, let us admit that. At the same time, we have to take the position that it is not true for narrow seas; that is to say, it has not been proved. For while some critics do not even attempt to prove that high speed is not of greater strategical value for narrow seas, the rest of them admit that it is of greater strategical value in narrow seas. Therefore, we must assume that high speed is of greater value in narrow seas until we get at least a *prima facie* case that it is not.

But the case is not completely stated even yet. We want to know whether this proposition of Mérys's is true for all Powers. Strategical conditions, and the function of the fleet, differ very greatly according to the geographical conformation and distribution of various states, and to their international characteristics. Let us take our own country, and let us ask what is the main function of our fleet? I think we must answer that the main function of our fleet is to control the "Narrow Seas," and therefore, *prima facie*, that its main strategical interest lies in high speed rather than in endurance,

certainly as to that part of the fleet which is intended for home defence. I feel that that statement of the function of the fleet is liable to be disputed, but I am quite prepared to maintain, though there is no time to do it now, were it disputed, that undoubtedly, from the point of view of scientific strategy, the control of home waters is beyond shadow of doubt the primary function of our fleet.

Now, as to the rest, imperial and commercial defence, how does it work out? Admitting that radius of action is the important thing in this case, where the operations are largely oceanic, we get this proposition, that the difficulty of the British task in imperial and commercial defence is in proportion to the radius of action possessed by the enemy's ships. It would seem, therefore, that in this case we ought to go rather for radius of action than for high speed. But in oceanic warfare, endurance, radius of action, does not depend entirely on coal capacity; it depends also for practical purposes on coaling supply and coaling stations. Our foreign authorities notice this and proceed to destroy the whole of their argument, so far as we are concerned, by admitting that for us radius of action is less vital than it is for them, owing to the number and disposition of our coaling stations.

What follows from this? If we force our rivals to sacrifice endurance to speed, the easier is our Imperial defence. By a policy of high speed we involve them in a strategical dilemma. They must either increase their speed so as to equal us in the vital area of our home waters, and so render our Imperial defence easy by reducing their radius of action; or they must sacrifice their position at home and contend with us in the oceanic areas, where we are particularly strong in coal supply, and able thereby to a great extent to neutralise their assumed superiority in radius of action. That dilemma seems to me inevitable so long as we go in for high speed. Now, the only escape from that—there is an escape, but only one—is for our rivals to follow us in building big ships, which combine speed and radius of action. That is our policy to-day? Is it wise?

Here I would beg to say a few words on this subject of big ships, because the whole question of the strategical value of speed tends to lose itself ultimately in the question of big ships. It is well to approach such a subject by asking two questions. The first question is: What is the tradition of the service? The second question is: What, theoretically, is the strategical effect?

What then, firstly, is the tradition of the service about big ships? If we turn to the highest authorities, who recently have dealt with this point, we find one of the best of them saying, that in adopting this policy of very powerful big ships, "the experience of generations of seamen has been discarded and declared to be wrong."

I venture to differ from that entirely. It is a question of history, and I hope I may differ without presumption from the distinguished officers who have held that point of view. I will not rely upon my own interpretation of history; I would rather call witnesses. In the whole roll of the great seamen of our Navy, there is no greater name on such a point than Sir Thomas Hardy, Nelson's Flag-Captain. It will be remembered that it was of Sir Thomas Hardy, Nelson said: "I

never knew Hardy wrong on any professional subject; he seems imbued with an instinctive right judgment." Hardy, in 1830, became First Sea-Lord, and, I believe, he is handed down in the traditions of the Admiralty as one of the best that was ever there. At that time, owing to the demoralising effect of a continued and undisputed command of the sea, we were going in for swarms of small cruisers and seventy-fours as ships of the line. Hardy, when he came to the Admiralty, laid it down as his guiding principle that it was powerful ships of the line which carried everything in a general action, and that it was large frigates which disposed of the smaller craft. I give you that on the authority of Sir John Briggs, in his work on "Naval Administrations." Sir John Briggs knew Hardy well. When he got to the Admiralty he immediately set about laying down a programme for three-decked ships only; he cut down the seventy-fours into 50-gun frigates, the 46-gun frigates into corvettes, and he struck from the list the whole of the small cruisers, or nearly all of them; that is to say, all the "donkey" frigates, as they were called then, and all the sloops and "coffin" brigs. That I would remind you is really the last word of the Nelson school, the last word of the sailing admirals, for it was also Hardy who introduced steam into the fleet.

When such a man does such a thing as that, we ought to be very careful in saying of recent policy that it betrays a want of knowledge and want of study of the art of war. I do not think any one would dare to say that of Sir Thomas Hardy, and Sir Thomas Hardy was clearly of opinion that big battle-ships were the ships that carried everything before them in a general action, and that large frigates disposed of the smaller craft. I do not say that that proves everything for us now, but it does prove that we ought to be very careful how we talk about the traditions of the service without having studied what the tradition of the service was throughout the whole period of which we are speaking.

Now let us leave that and ask our second question: What is the strategical effect, theoretically, of big ships, for us? Big ships, as we see, are entailed by an effort to combine high speed and radius of action. I venture to put it to you that big ships in themselves are strategically favourable to us because theoretically they are favourable to the power which has the best harbours. It means that if we have a number of deep water harbours, and our rivals have little more than tidal or shallow harbours, our strategical positions are better and more numerous than those of our enemy. On this account, therefore, that is, from the point of view of big ships as well as from the point of view of our wealth in coaling stations along the ocean routes, a policy of high speed seems to be distinctly one method of improving our geographical conditions.

It is to this point we seem to come by a process of purely theoretical argument. The conclusion may, of course, be wrong. All I desire to assert is, that the line of argument I have tried to indicate is one that has been neglected and one which really ought to be worked out by competent authority. I feel very strongly that on such a subject as this an open mind and strict impartiality are absolutely necessary. I know that the argument, as I give it, must appear hostile to those who have opposed high speed. That is not from any feeling of hostility. It is merely a logical necessity, because

the onus of proof is on them. They have raised a question of the greatest importance. There is no doubt that we were all inclined to take the value of high speed a little too much for granted. They have undoubtedly done great good in raising this question, but in doing so they are challenging the wisdom of an old tradition, and they must accept the burden of proof. Consequently, in testing their arguments, we are bound to take the attitude that they have not proved their case. The tradition of the service has undoubtedly been, so far as I can understand it, ever since Elizabethan days, towards getting the utmost possible speed in battle-ships, and great sacrifices of fighting strength have constantly been made for it. That is too big a subject to go into now; I would merely take the alpha and the omega. As to the alpha, we see Drake's partiality for "a middle-sized" ship. You will remember he chose for his flag-ship the 500 ton "Revenge," and a number of those ships appeared in the programme which followed the Armada. The omega, of course, is Nelson's fondness for seventy-fours.

So much for the argument on the general case. Now I have the rather less pleasant task of coming to the second part of my subject, which entails pointing out defective arguments and false or partial arguments. I quote again from a distinguished advocate of moderate speed:—"A good position is more important than superior speed, and can be used to counterbalance the strategical advantages belonging to the latter." That is one of the arguments that appear in one form or other over and over again, that securing a good position is more important than superior speed. I cannot help feeling that that is very like saying that speed does not matter if you are only quick enough. It involves almost a logical absurdity—I do not use the word opprobiously, I mean a *reductio ad absurdum*—and it comes from neglecting the ascertained rules of strategical discussion.

It departs from those rules because it introduces personal and accidental factors. Really, such an argument is of no weight at all unless we are to assume that we always have available better positions than those of our enemy, or that we have greater strategical ability. Such assumptions are destructive of all scientific strategy. Most of the great writers have always laid it down that you must determine the normal first, and to do that you must eliminate all accidental and personal factors. First determine the normal, and when you have done that you can make any allowance you like for accidental and personal circumstances. Therefore, I would put it to you that the whole of that line of argument is contrary to the ascertained rules of discussion, and ought to be eliminated.

What it really comes to is, that it is an argument for tactical and strategical study, being quite as important as powerful arms in warfare. That is, I think, a proposition which nobody denies nowadays.

The second class of argument, if you can call it an argument, lies in the danger of contrasting speed with offensive and defensive fighting power. Of course, speed is as much a part of a fighting ship as a horse is of cavalry. It has no strategical or tactical significance except as part of a ship's offensive and defensive power. Therefore, stating the case in that way rather tends to beg the question, and

should be avoided. It is not really very important, but the whole question is so difficult that it is just as well to be precise in statement in order to reduce the possibility of error. The real question, of course, is whether high speed or moderate speed gives the higher fighting power all round.

Then there is the fallacy of that dictum which is constantly repeated that a fleet is no faster than its slowest ship. Very often, speaking strategically, the converse is really the case. The whole principle of the "attack in general chase" rests on the truth that the speed of the chasing fleet is the speed of its fastest vessel, and that the speed of the chased fleet is the speed of its slowest ship. Therefore, one has to be very careful in founding any argument on a dictum of that kind. The case that is quoted in support of this argument is generally the battle of Quiberon, and that is quoted also as a case where tactics were more important than speed. I cannot quite understand that. So far as I can read about what happened at Quiberon, there were no tactics at all. Hawke certainly made a signal under his new "Additional Instruction," for the leading ships to form line as they chased, but they were in such a hurry that they did not do it, and the action was never more than a general chase. There were no tactics. It was simply a question of time and speed. Had Hawke had only a little more speed there is no doubt that the French would have suffered much more severely, and not given us half the trouble they did afterwards.

Next, there are certain doubtful deductions from history I should like to deal with; and one is the assumption that the prevalence of the "seventy-four" type in relatively large proportion in our sailing fleets was due to the necessity being felt for numbers of units rather than for the power of each unit. Now, that assumption is used in order to condemn the increasing size of ships which is assumed to come about in our effort to combine high speed with endurance. I submit that there is no proof whatever of that. It is a mere assumption. The preference for the "seventy-four" type clearly may have been chiefly due to a desire for speed. In the few places where I have been able to find any reasons for the selection, the reason is superior speed and ability to work to windward, which, of course, was equivalent to speed in those days.

I should like to quote one of the passages referred to. It is from the pen of Kempenfeldt, who was probably the most scientific of all our real fighting men. In 1782 he was writing to Lord Sandwich about a squadron he wanted to have in the Soundings to act defensively against the combined fleet of France and Spain, which was supposed to be coming into the Channel, and he says: "Such a squadron should be composed of two-decked ships only, so as to ensure its purpose. It must have the advantage of the enemy in sailing." That is clearly a case where "seventy-fours" and lesser ships were chosen because of their speed. In dealing with this question historically, we must never forget that in sailing days the sea-speed of battle-ships tended to be in inverse ratio to their size; the bigger the ship the slower it was. The reverse is the case now. In the old days they could not get speed without very great sacrifices of what is

called fighting power. To-day, clearly, that is not true, if we admit increase of tonnage.

There is another class of argument, which I will put under the head of failure to recognise recent changes in strategical conditions. Of course, such things do change, not so much as in tactics, but strategy does change, and I venture to submit that torpedoes, wireless telegraphy, and submarines have produced changes of strategical conditions—not fundamental, perhaps, but very important, and the chief importance is that they practically destroy between them the whole of the old system of blockade. The old naval strategy in its final developments, at least, was based on close blockade, and that is now impossible. The general opinion is that open blockade will have to take its place. Now open blockade involves finding a secure interior position—a position that is out of torpedo danger, yet close enough to ensure contact with the enemy's fleet if he attempts to secure his object or to interfere with yours. For example, the position which Admiral Togo took at Mesampho. If you think of it, the possibility of finding such interior positions depends entirely upon your speed and not at all upon your radius of action. A position which would be exterior by distance may become interior if you have superior speed. You will find that the size of the area within which open blockading positions may be sought, will be proportional to your speed. Captain Mahan sought to get over this argument for speed by showing that Admiral Togo could have intercepted the Russian fleet, even if it had been faster than his own. But his argument is only another instance of the error of the single case. All it really shows is, that the geographical accidents of the Japanese Sea were peculiarly favourable to the Japanese. It cannot possibly show anything else. To meet this argument we have only to refer to another case, which he has made peculiarly his own. It is he who, above all other people, taught us the real weakness of our Plymouth and Torbay positions, and demonstrated that they were not really interior positions with regard to Brest. But with anything like superior speed there would have been little difficulty about controlling Brest from either of them.

There is one more point. It is really the most difficult and the most important of all, and that is, that these distinguished officers and other writers, in arguing against high speed, have entirely omitted to consider defensive warfare. One can hardly blame them, because this omission is undoubtedly the characteristic disease of contemporary strategy. In times past a general defensive has been forced upon us, and it may be again. But that is not so much the question as this: that we must always use the defensive whatever we are doing.

We cannot possibly concentrate a fleet for great offensive movements without containing operations elsewhere. If outside the main offensive sphere, you have forces capable of taking the offensive by their numbers, so far, theoretically, is your strategy bad, because you have not concentrated as much as you might have concentrated at the vital point. You cannot get perfect concentration on any one point of the war, the secret of all strategy, without defensive operations elsewhere. Therefore, when we read in these arguments such expressions as, "The tradition of the British Navy is always to take the offensive," let us be on our guard. That expression is always

used as though it excluded the defensive, whereas the foundation of all strategy is that the offensive connotes the defensive always. The worst of all mis-readings of British naval history is that extraordinary fetish of the offensive, as if the offensive were a thing that could stand by itself. It is a fetish that kills strategy. It grew up in the days when we had that easy command after Trafalgar. It killed strategy just as Trafalgar killed tactics. It was not the view of the great 18th century admirals. You have only to think of the meaning of that technical expression which so often recurs: "A fleet to attend the motions of the enemy." That was the defensive fleet, which was the foundation of all the work of our great strategists.

If you will bear with me a moment, I should like to quote a strong example of that. Let us take one again from Kempenfeldt, in 1779: "Much, I may say, all depends upon this fleet"—that was the fleet which was holding the mouth of the Channel against the allied fleet which was coming up to take command of our narrow seas. "Much, I may say, all depends upon this fleet; it is an inferior against a superior fleet. Therefore, the greatest skill and address is required to counteract the designs of the enemy, to watch and seize the favourable opportunities for action, to catch the advantage of making an effort at some or other feeble part of the enemy's line; or, if such opportunities do not occur, to hover near the enemy, keep him at bay, and prevent him attempting anything, but at risk or hazard, to command their attention and oblige them to think of nothing but being on their guard against your attack." That was Kempenfeldt's view of a defensive fleet, the fleet to attend the motions of the enemy. There are similar remarks of Nelson's, but never so clear as Kempenfeldt's. Here is another of his sayings, part of which I have already read to you: "When inferior to the enemy, and you have only a squadron of observation to watch and attend their motions, such a squadron should be composed of two-decked ships only, so as to ensure its purpose. It must have the advantage of the enemy in sailing, else, under certain circumstances, it will be liable to be forced to battle and give up some of its heavy sailers. It is highly necessary to have such a fighting squadron to hang on the enemy's fleet, as it will prevent their dividing into squadrons for intercepting your trade or spreading their ships for a more extensive view."[1] There are several others I could quote to you to the same effect. You will recollect that at that time we were making our great effort in the West Indies to prevent the French getting hold of them. We sent out every ship we could possibly spare from the home squadrons, and they were reduced to their lowest defensive level. Kempenfeldt was employed in the Channel, once as flag-captain and the second time as a junior flag officer. In all his letters and memoranda he points out that the way to work a defensive fleet is to avoid action, except on your own terms, to worry your enemy, and so on. But throughout all these utterances you find the whole thing is hanging on speed, speed, speed, the whole way through, as being the only possible manner in which the work can be done. In the opinion of those men undoubtedly a successful defensive depended on superior speed.

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[1] For these quotations from Kempenfeldt I am indebted to the kindness of Professor J. K. Laughten. They occur amongst Lord Barham's Papers which he is editing for the Navy Record Society.

The truth seems to be that we cannot possibly maintain the defensive ourselves, or break the defensive, if the enemy adopts it against us, without superior speed. I need not remind you of those long, uninteresting years, which consume so much of our naval history, when France assumed the defensive. We could not break it, and she kept those old wars going year after year, simply because we were never able to force a decisive action when we had the chance. Speed is at least one way to get out of that difficulty. We cannot rely on our tactics being always superior. Although public writers abroad seem taken with the idea of the offensive, introduced by a somewhat loose reading of Captain Mahan's works, there are pretty clear signs that the Admiralty staffs are not. They know the power of the defensive when it is used as Kempenfeldt meant it to be used, and nothing but speed can give us any sure hope of breaking through that attitude.

Admiral Sir N. Bowden Smith, K.C.B.: I think that the Institution and the Service generally is much indebted to Mr. Julian Corbett for having brought this important question before us. You must be all aware from what you read in the daily press and periodicals that there is a great difference of opinion on this subject. On the one hand, we have two of the most distinguished writers amongst our flag officers who tell us that there is no great strategical or tactical value in speed, and their opinion seems to be shared by the well known writer, Captain Mahan, of the United States Navy. On the other side there are several officers who affirm that speed is of great importance, and there is an excellent paper by Lieut.-Commander Sims of the United States Navy, which puts the subject clearly before us, and is well worth studying. I think one of the greatest objections to high speed and consequently very large ships is a matter that has been touched upon by the lecturer, namely, possibility of loss by mine or torpedo. In that respect a large and valuable ship is as likely, or even more likely, to be destroyed by a mine than a smaller ship, and that is, to my mind, one of the great objections. The author alludes to "Barfleur," who states that high speed necessarily reduces the radius of action. That is so but I would rather have the speed and sacrifice to a certain extent the coal endurance, because you cannot increase the speed of a ship after she is once built, whereas you can to a certain extent supplement her coal endurance by taking with the fleet on long voyages or ocean cruises, vessels carrying coal or liquid fuel. This arrangement must be carried out in future warfare by all ships or squadrons carrying out operations far from their base, each ship taking every opportunity of replenishing her stock of fuel whenever possible. With regard to the value of speed, I would point out to those who say that it is of no great tactical or strategical value, that both by land and sea one great object in warfare has been that of getting to a certain place in a certain time. If you do not arrive at a rendezvous in the required time, the object for which you wanted to be in that position may be lost. Barfleur refers much to former history in support of his arguments against the value of high speed. Although I greatly appreciate his excellent writing, I do not agree with him in that respect, and I would like, if you would allow me, to make a few observations on the late battle in the Sea of Japan, with regard to which I have made some extracts from the writings of men who actually witnessed the action, or who were able to report it on very good authority, I understod the lecturer to say that a good position is better than superior speed.

Mr. JULIAN CORBETT: That is from Barfleur.

Admiral BOWDEN SMITH: Well, in the late battle off Tsu-shima it certainly was, I think, superior speed that enabled Togo to gain his great initial advantage. I do not think anybody can deny that superior speed must give choice of position before engaging. We know that the Japanese during the whole course of the action kept up a 15-knot speed, whereas the Russian ships generally were not able to steam more than 12 knots. One writer says that "this superiority of speed was not long in asserting its influence." Another account says that the Japanese in single line ahead were steaming at 15 knots, and were able thus to draw ahead and concentrate their fire on the leading Russian vessels. In fact, the Japanese superior speed gave Togo the coveted lead. The Russian Admiral Enquist and others repeatedly referred to the superior speed of the Japanese as conducing to their success. Perhaps we should not think too much of that statement because the defeated side naturally seek an excuse for being defeated, and they would take advantage of anything that seemed to show a cause for their great catastrophe. During the action the weather appears to have been very misty and the hostile fleets obscured from each other; in fact, they lost each other to a certain extent, the fleets becoming separated, although the battle was decided almost in the first hour. It was on the second day that Togo, who had not fully realized the havoc he had wrought amongst the Russian ships, succeeded in coming up with the remainder of their fleet and, surrounding those which were still in fighting condition, forced them to surrender. Had the Russians the speed of the Japanese ships some of them would certainly have escaped to Vladivostock. As it was, out of 38 Russian vessels which commenced the action, we know that 22 were sunk, seven captured, seven disarmed and interned, and only two got away altogether free; whereas during the two days' fighting the Japanese only appear to have lost two destroyers and one torpedo-boat. I do not mean to say for a moment that it was the superior speed alone which mainly gave the Japanese their victory. They were doubtless far better seamen; they manœuvred their ships much better, and their men were much better gunners. The Russian ships in their over-loaded state were too easily sunk or too readily turned turtle. Although the Japanese fire was so much more effective than that of the Russians, it must not be inferred that the Japanese ships were more heavily armed, because such was not the case; they were much more lightly gunned than the Russian fleet. The Russians had 26 12-inch guns against only 16 of the Japanese, and 15 10-inch guns against one of the Japanese, while of the smaller calibre guns the Japanese had the preponderance, carrying 30 guns of about 8-inch against 12 in the Russian ships. To show how ineffective the Russian fire was, the Japanese, as I have before stated, only lost three torpedo vessels and had only 116 killed and 538 wounded. On the Russian side they had the great loss in ships already mentioned, and we know that something like 6,000 prisoners were captured. As for the Russian dead and drowned, we shall probably never know the number. It is generally supposed that the Russians showed insufficient courage, whereas we know that some of their ships fought in the most gallant way and continued in action even when they were badly on fire, or in a sinking condition. I have ventured to make these remarks on this battle because Barfleur and other writers quote so much from past history and do not go sufficiently into the history of our own time. Although I realize the great cost of high speed, it appears to me to be a modern necessity. Of course, there must be a limit to speed, and you must not sacrifice everything to it. I was never able to

understand why a few years ago we built eight scouts at a cost of about 2¼ millions entirely for speed and nothing else. In these days of wireless telegraphy news can be easily communicated, and in heavy weather a cruiser could carry out scouting duties when these scouts could not face the sea. The same remarks apply to some of the scouts now building. When it comes to fighting ships we must have a certain amount of speed, even in our battle-ships. All mail and passenger ships are increasing their speed, and in the Navy we must keep pace with the times.

Vice-Admiral W. H. HENDERSON: When the question of speed was first brought forward by "Barfleur" I welcomed a scientific discussion on the subject, because I felt that we in the Service had not really realised its importance, that we had had no guiding lights to direct us on its scientific aspects. I need not say that I have been waiting and hoping for a rejoinder to those articles, and I beg to thank Mr. Julian Corbett for coming forward in the way he has done for the benefit of us all, and to state that I most thoroughly agree with what he has said in his paper.

The CHAIRMAN (Admiral the Hon. Sir E. R. Fremantle): I must ask your indulgence to allow me to say a few words before I go away, as I have to catch a train. We have heard a very instructive lecture from the philosophical and historical point of view, and it is not easy for us to criticise it or speak about it at short notice. There are, however, some points which we can take up and consider, but more requires further consideration, and I think that perhaps accounts for the reluctance of so many of the naval officers I see here to-day to come forward and enter upon any criticism on a subject of such great importance, and one that demands such close attention and close argument. But I will endeavour to make a few remarks, strictly confining myself to the question before us, namely, the value of speed. I have been for a long time an advocate of speed. I had the honour of reading a lecture to this Institution a good many years ago, entitled, "Speed as a Factor in Naval Warfare," and I treated the matter then principally from the strategical point of view. I do not propose to deal now, at all events at any length, with the strategical value of speed. As the lecturer says, the strategical value of speed is beyond doubt. I entirely agree with him that it is rather begging the question to say that if you have got the best admirals, if you have got the best position, if you have got the inner lines, then, to a great extent, you can dispense with speed. I venture to think that is not a fair line of argument, because if we are to argue the question at all from the philosophical point of view we must say that the admirals are the same and the strategical positions are the same. Strategy undoubtedly has been altered, and must be altered, to a limited extent by the weapons in use. Tactics must have some effect on strategy. But what has a much greater effect is undoubtedly the position which you are holding or wish to hold, in short, the theatre of operations. But beyond that I think there can be no doubt that strategy is eternal; the rules we have to follow are much the same as those that our ancestors had to follow. With that I will leave the question of strategy. Now, one point which the lecturer had dealt with is whether radius of action falls in proportion to rise of extreme speeds. It may be so theoretically: probably it is so. Of course, if you take a scout and fill her up with machinery she has very little room for coal, and she expends a great deal of coal, but that is an extreme case. But assuming you have one of the "County" class, of 23 knots, and another vessel which is capable of going no more than 20 knots, and you want to make a passage at the rate of 15

knots, you will find the 20-knot vessel is going pretty nearly at her top speed in a passage, say, to the West Indies, whereas the 23-knot vessel is going at comparatively easy speed, and you will probably find the 23-knot vessel is the more economical vessel, and has a larger radius of action at that speed than the vessel which was supposed to have the larger radius of action at that speed. I do not consider at all that it is correct to say that the radius of action falls in proportion with the rise of speed. Under the instances to which I have referred the argument is in favour of speed. We have had an appeal to history generally, and I think it is quite right that we should appeal to history. I am afraid nowadays there is too much assumption that all history is what is commonly called "ancient history," and that under these circumstances we can discard it. I do not think the lecturer thinks that, but to some extent he would almost appear to adopt that view in talking about Sir Thomas Hardy and scrapping ships. It is a question of a sense of proportion—what you ought to scrap. There is no doubt that "donkey" frigates and the small brigs were many of them dangerous. The "donkeys" certainly earned their name; they could neither fight nor run away. Many of the brigs went by the expressive names of coffins. Undoubtedly Sir Thomas Hardy, who was a sailor and one of the best First Sea Lords we ever had, was right that bigger ships were wanted and that to some extent it would be right to scrap the coffins and "donkey" frigates. To what extent that was carried I do not know, but if I recollect Sir Thomas Briggs, it was simply due to the fact that he did not like those inferior class of ships. He also advocated three-deckers. I recollect in very early days, when I first joined the Navy, Charley Napier used to write in *The Times* frequently urging the building of three-deckers as the things that were most necessary. I think for close action in those days three-deckers were the things that were necessary. There are several things said in the paper that are admirable. The tradition of the Service, the author says, since Elizabethan days has been towards getting the utmost possible speed, and a great sacrifice of fighting strength has been made for it. I daresay some of you will recollect Nelson's dictum with regard to three-deckers. He was not altogether against three-deckers. At Trafalgar, you will recollect, the first three ships of the weather line were all three-deckers, but, nevertheless, he said that two seventy-fours alongside were better than a three-decker a long way off. Appeal has been made to the French, and I think it is quite right that we should refer to the French on many of these points, because there is no doubt they are very thoughtful observers, that they study the matter in a more scientific manner than we do, and when they talk of the difference between ocean strategy and strategy in the narrow seas, there is a good deal to be said for their views. I think we can take some exception to the statement made by the lecturer that the main function of the British fleet is to control narrow seas. It is certainly a very important function, but the main function of the fleet, I think, to quote Jurien de la Gravière, is to occupy the great ocean highways. I venture to think, in the position in which this country is now, our business is to occupy the great highways. It is most important to the stability of the Empire, and almost as important to the defence of this country. I think, personally, we have neglected too much the necessities which this Empire requires. When the lecturer talks, as he very properly does, of the bases which we have, he might more correctly have spoken of the bases which we had, because we have dropped a great many of them. I will conclude by just referring to what Captain Davelny writes in "*La lutte pour l'empire de la Mer*," published last year. He gives an interesting study of the battle off Tsu-shima, and he has studied the question tactically and strategically. "En defini-

tive, la vitesse est bien un element tactique; il serait dangereux d'en conclure qu'elle est un arme." I think that is a very good definition. As the lecturer said, it is not an arm. The horse was not intended to fight, although he might trample down someone; he answers in the same way that speed may render a ship capable of ramming another. At the same time, it is not so much an arm as it is an element in the fleet. Politvosky is the name of the gentleman who wrote to his wife, and whose letter was published after his death at Tsu-shima. He was in the Russian Navy, the Chief Constructor, as we should call him. He gives pretty fully the damage which took place in Rodjestvensky's fleet, and tells us how extremely slow it was. I think it was the Russian Captain Semenoff who mentioned the difference of speed between the two fleets as something like six knots. We do not know what the difference of speed was, but it was probably very great. From Politvosky's account and from the speed which Rodjestvensky's fleet kept in their passage from Tangiers to Madagascar, I think they averaged 117 miles a day—very little more than sailing speed, chiefly due to the new ships, which were constantly breaking down. While on that I should like to say one word with regard to what the lecturer said about the fast fleet and the slow fleet. I have a note here with regard to the fallacy of the dictum that a fleet is no faster than its slowest ship, where the author says "As often as not the converse is nearer the truth," and that the decisive speed of the chasing fleet is that of its fastest ships. I do not think it is a fallacy speaking generally. I think it is accurate. He defined it accurately in his speech, but not in his summary. I was going to say that it was generally true, but more so for the chased than the chasing fleet. The chased fleet speed is as the slowest ship, and it is true to say that chasing speed is that of the fastest ship. There is one more summing up of Captain Davelny that I should like to mention. He says, "La vitesse est l'auxiliare de la force; elle ne peut la remplacer. Il ne faut s'en servir qu'avec discernement, et il semble bien que Togo n'aurait pas deux fois, perdu de vue l'enemi s'il avait marché moins vite." In fact it is perfectly clear that twice Togo did lose the Russian fleet, but each time he was able to come up with it and bring on the action again. The same thing almost happened on the 10th of August. Twice he got behind and both times he was able to pick up the Russian fleet again. If that is not of value, whether you call it strategical or tactical, I do not know what is of value. I have mentioned the question of scrapping. What the lecturer says seems to me, in his opinion, practically to justify the amount of scrapping we have had in the Navy, but for my part I cannot agree with it. There is a tendency to scrap still further, and I think it is an extremely dangerous tendency. However, we are not talking politics here now, and I will not dwell upon that. I do not think the lecturer said enough about the fact that if we are to have very high speed, and also all the offensive and defensive power that is now necessary on the first-class battle-ship, the question of size will have to be taken into consideration. The size keeps constantly increasing. I think on that subject Mahan is on sound ground, as is also the writer on naval policy, Barfleur. One does not see where it is to end. It is a truism that has been repeated over and over again, but is always being forgotten, that however big the ship is she is in danger of being blown up by a sub-marine mine. The bigger the ship the fewer the units we can have, and consequently the more difficult it is to detach a couple of battle-ships or anything of that sort. Under these circumstances there is room for a good deal of argument with regard to the extreme size to which we are going. It is not a point on which one can be dogmatic at all. It may be absolutely right

to build "Dreadnoughts," and I do not say it is not. I am not prepared to say anything. If it is right to have a single armament of very heavy guns, as we have in the "Dreadnought"—and it is more a question of gunnery than anything else—I think it is necessary to have "Dreadnoughts." But we want ships for a good many purposes in warfare, not only scouting, protection of commerce, getting information, landing at some place or other, lending a little assistance to some person or other, but for twenty different circumstances. There is the history of the wars of the Mediterranean in 1797-8, our wars with France afterwards, the actions of Lord Cochrane on the coasts of France and Spain, of Nelson on the coast of Italy or at Corsica, when he had to embark soldiers, and all that sort of thing. None of these are scouting or protection of commerce, and yet they are the everyday use to which you have to put ships in a war. Under those circumstances we do want numbers, and that is an argument not sufficiently dwelt upon. I entirely agree with Barfleur, who says that if there was a war to-morrow want of cruisers would be found written in the hearts of many admirals. We appeal to history, and it shows that the number of small vessels increased largely after we had absolute command of the seas following Trafalgar. I thank you for having listened to me, and I am very sorry to have to go away. I should like to have heard the rest of the discussion. Before I leave I wish to express my thanks to Mr. Julian Corbett for having come here to-day. I feel that the lecture is one of the greatest value, and I feel it was a great compliment to ask me to come and preside. I am only sorry I cannot do more justice to the situation, as it is a subject which interests me very much.

Mr. Julian Corbett, in reply, said:—I should like to express my great satisfaction at having received such high endorsement as has been my good fortune this afternoon. With regard to some of the omitted arguments, I know that I have omitted nearly all the arguments that tell against high speed, but that is simply because they have been so admirably put by more capable people already. My real reason for coming here was to put the other side of the case, as Admiral Henderson was kind enough to say. An impression seemed to be abroad that there was very little to be said on the other side, and that was due to the extreme ability of the officers who had ventured to doubt whether, in the matter of speed, we are not going too far. As I said, that seems to me a most desirable thing to have done, but I could not help feeling that in the enthusiasm of trying to shake our too self-confident position on the question of speed, they had been carried a little further than they wanted to go when they started, and that the time had come when one ought to put forward the general grounds on which the old tradition in favour of speed seemed to rest. With regard to concentration on the van, it was a point I omitted. It is constantly said that the power which superior speed gives you of concentrating on the enemy's van can be easily neutralised by his turning away. I submit that it is not a sufficient argument, because it admits the fact that superior speed tactically gives you the power of controlling your enemy's course. It is surely a great strategical advantage to be able even to turn your enemy off the course he is trying to take. I am sure cases will suggest themselves to your imagination where such a tactical advantage might decide a whole campaign by preventing the enemy continuing the course which it was necessary for him to continue in order to attain his object. Therefore, when you say that superior speed can be neutralised tactically by the power of turning away, although you

are denying the tactical advantage of speed, you are giving it an enormous strategical importance. With regard to Sir Edmund Fremantle's remark, that I seemed to wish to wipe out the whole of history, as that happens to be my profession, it is not very likely that is what I meant. What I did mean was, that just as I am too much inclined, perhaps, to give weight to old examples, so officers are inclined to give too much weight to recent examples. For tactics, perhaps, that is not a very objectionable course. But when you are dealing with strategy it is extremely dangerous to deal with a few recent examples, because although they may cover the tactical ground, they cannot possibly cover the whole of the strategical ground. Therefore, what I meant was precisely the opposite, that for strategy the old examples are really of more value than the modern ones, simply because they are more numerous.

GUN DEAFNESS AND ITS PREVENTION.

By ARTHUR H. CHEATLE, F.R.C.S.
Aural Surgeon to King's College Hospital, and to King Edward VII.'s Hospital for Officers.

Wednesday, 23rd January, 1907, at 3 p.m.

Colonel J. H. Bor, C.M.G., R.M.A., Assistant Adjutant-General, in the Chair.

INTRODUCTION.

I feel that no apology from me is necessary in directing your attention to this subject, for it is one which closely affects all the officers and men in the Navy and in the artillery branches of the Army.

My object is to raise the question with a view of preventing the ear troubles caused by gun fire; such prevention being, in my opinion, necessary and possible. I will, presently, give the result of an examination of 50 men made by a naval surgeon.

In King Edward VII.'s Hospital for Officers, Sister Agnes tells me that the majority of the naval officers passing through her hands are more or less deaf. I have been told by a late director-general of the Naval Medical Service, that he did not hear many complaints of gun deafness; but it is unnecessary to point out that he would be the last man to whom an officer would report his infirmity unless he was absolutely obliged; besides, the deficiency of hearing might not be sufficient to interfere seriously with his duties, although it decidedly hampered his social and domestic happiness.

In peace time the fire from our own guns only has to be considered; but in war the noise and concussion of the enemy's shell bursting on board have also to be taken into account; and I can imagine the crew of a battle-ship after an engagement being so deaf that orders could not be heard; indeed, we read in the account of the capture of the "Variag," in the Russo-Japanese War, that the crew were absolutely dazed and deaf when taken off.

Anatomy and Physiology of the Ear and Nose.

In order that you may understand clearly how gun deafness is produced, and how it may be prevented, I will describe, as briefly and simply as possible, the anatomy and physiology of the hearing apparatus.

The world is really one of complete silence; our ears and brain convert waves which pass through the air from a vibrating body into what we call sound.

The simplest form of hearing apparatus is a hearing nerve spread out in a small sac containing fluid; but as we pass up the animal kingdom it becomes more and more complicated. The organ is not always situated in the head; in some instances it is placed in extraordinary situations, many most interesting specimens, prepared by Professor Stewart, may be seen in the Royal College of Surgeons' Museum. For instance, among the crustaceæ, some, like the lobster, have the hearing sac in the antennules, some have the hearing membrane in the forelegs, and others in the abdomen.

In man the hearing sac is placed deeply in the head, and various conducting media intervene before the sound waves can reach it.

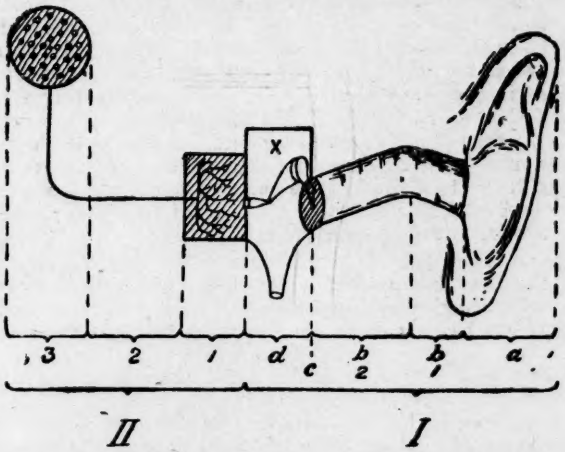

DIAGRAM OF THE LEFT HEARING APPARATUS SEEN FROM IN FRONT.

I. Collecting and conducting portion.

II. Perceptive portion.

a. Auricle.

b_1. Outer portion of the passage made of gristle.

b_2. Inner portion of the passage made of bone.

c. The drum with a portion of the outermost hearing bone buried in it.

d. The middle ear with the three little hearing bones running across it, the innermost one fitting into the hole in the inner wall. At × the middle ear is continued backwards. Below, the middle ear is continued as a tube which opens into the space at the back of the nose.

1. The internal ear containing fluid in which the delicate ends of the hearing nerve float. The outer wall forms also the inner wall of the middle ear and has the hole in it.

2. The hearing nerve leaving the internal ear.

3. The hearing centre in the brain receiving the hearing nerve.

There is, first, a passage, about 1½ inches in length, across the bottom of which is stretched what is ordinarily known as "the drum" but what is really a drumhead. The passage is surrounded in its outer part by gristle or cartilage, and in its inner part by bone; it runs first upwards and backwards and then downwards and forwards; these double curves serve to protect the thin drumhead from injury, and to prevent the introduction of foreign bodies into the deeper part of the passage.

The drumhead or membrana tympani is a thin, more or less, tightly stretched membrane, completely closing the bottom of the passage, and having part of a small bone embedded in its centre.

On the inner side of the membrane is a cavity known as the middle ear, its inner wall being composed of dense bone, which has a small hole in it. Across the cavity stretch three small hearing bones each joined to the other; the outermost bone is, as I have said, partly embedded in the membrane; the innermost one, shaped exactly like a stirrup, has its foot plate fitting into the hole in the inner wall; the middle bone joins these two together. Attached to the innermost and outermost bones are small muscles, which regulate the tension of the membrane; they prepare the chain of bones for the reception of sounds, and undoubtedly act in the way of damping excessive noise and concussion within certain limits.

The hole in the inner wall into which the stirrup bone fits, leads to a bony box containing fluid, in which the hearing nerve ends in exceedingly delicate filaments. From the inner wall of this bony box the hearing nerve runs to reach the hearing centre in the brain.

Sound waves, then, pass down the passage to the drumhead; from it they are conducted across the middle ear by the chain of the three little hearing bones to the fluid in the bony box; they finally pass through this fluid and stimulate the endings of the hearing nerve, which then carries the impulse to the hearing centre in the brain.

From the front and lower part of the middle-ear cavity a small tube, ralled the "Eustachian" tube, after the anatomist who first discovered it, passes downwards and inwards to open into the side of the space at the back of the nose. The thin lining, or mucous membrane, from the space at the back of the nose, is continued up the tube to the middle-ear cavity, where it becomes extremely thin, and not only lines that cavity, but forms folds and pockets round the chain of small bones and their muscles. This tube is, as a rule, just closed, but opens during swallowing, yawning, etc.—there being muscles for the purpose.

The tube serves to supply air to the middle ear, as it is necessary for normal hearing that a certain amount of air should be present in that cavity. Any interference with the patency of the tube causes a certain amount of deafness, owing to the inability of air to enter the middle ear; the cavity becomes exhausted of any air it may contain, and the atmospheric pressure is allowed to push in or depress the membrane. It is important that the tube should be capable of being easily opened in those exposed to gun fire, for severe pushing in of the membrane, caused by a sudden and severe condensation of the air in the passage, is compensated by the escape of some of the contained air down the tube; if obstruction exists, there is little or no air behind the membrane to form a resisting cushion, and there is no

compensatory escape of such air as may be contained, and so the membrane may be ruptured or the nerve of hearing concussed, or both injuries may occur. As the mucous membrane, which lines the tube and middle ear, is continuous with that lining the space at the back of the nose, and, therefore, with that of the nose in front and the throat below, anything which causes the nose or throat to be unhealthy, is likely to produce an unhealthy condition of the Eustachian tube and middle ear. This leads me to the anatomy and physiology of the nose and the space at the back of the nose.

The interior of the nose is composed of two identically shaped cavities, which run straight backwards from the nostrils; they are separated from each other by a middle partition or septum, which

DIAGRAM OF THE LEFT SIDE OF THE NOSE, MOUTH AND THROAT, SEEN FROM THE SIDE.

The face is seen in outline. The tongue is present in the floor of the mouth. The roof of the mouth is formed in front by the hard palate and behind by the soft palate.

The outer wall of the nose is exposed and shows, in a diagrammatic way, the three blood-containing bodies running one above the other from before backwards. Behind the back ends of these bodies and the septum and above the soft palate is *the space at the back of the nose;* the opening of the middle ear tube can be seen on its side wall. It is on the curved roof of the space at the back of the nose that adenoids grow.

ends behind in a free border. Behind, the two cavities open into a cavity common to both—the space at the back of the nose or naso-pharynx. If we run the tongue backwards from the front teeth along the roof of the mouth, we feel that the front part is hard, being made of bone (hard palate), and the back part is soft (soft palate).

The hard palate forms the roof of the mouth below, and the floor of the nose above. The junction of the hard and soft palates marks the vertical limit of the back part of the nose.

If we make a vertical section through the nose and head, a little to one side of the partition or septum, we see the outer wall of one side of the nose and of the space at the back of the nose. We see on the outer wall of the nose three bodies lying horizontally one above the other; these are composed of blood vessels covered by mucous membrane; they are concerned in moistening, warming, and filtering the air which is breathed in.

Behind these three bodies is the side of the space at the back of the nose. The roof of this space curves downwards and backwards to form the back wall of the throat, and is a continuation of the roof of the nose. The soft palate, with the uvula in the middle, is made up of muscles covered by mucous membrane, and forms a movable floor to the space. This soft palate is capable of being moved up or down; when it is down it allows air to pass in and out of the nose; when we swallow it is pressed right against the back wall of the upper part of the throat, in order to prevent that which is swallowed from passing upwards and out through the nose. In diphtheria the soft palate is often paralysed and allows milk to pass freely out of the nose on swallowing. On the side wall of the space is the opening of the Eustachian tube; so you can appreciate that the lining or mucous membrane is continuous with that lining the tube and middle ear.

One of the most common causes of obstruction to the tube is a common cold, which is simply inflammation of the mucous membrane of the nose, naso-pharynx and throat due to infection by a micro-organism. In infancy and early youth a common source of Eustachian obstruction is what is known as "adenoids," a chronic enlargement of a tonsil which is always present in the roof of the naso-pharynx, situated immediately behind the upper end of the free border of the septum and stretching from one side of the space to the other. Adenoids prevent proper nose breathing, they predispose to frequent colds, and are a source of chronic catarrh or chronic inflammation of the mucous membrane, and, therefore, of obstruction of the Eustachian tube.

The Effects of Gunnery on the Ears.

We may consider the effects of gunnery under two heads:—

1. The effect of sudden condensation of the air in the passage.
2. The effect of repeated and prolonged exposure to noise.

1. Sudden Condensation of the Air.

In a normal ear, with a healthy Eustachian tube, we have seen that there is a mechanism by which the ear is prepared for a rapid and great condensation of air, if it has warning; but—if the con-

densation is unexpected; if it is over a certain amount; if the Eustachian tube is blocked—the membrane may be ruptured, or the condensation may be passed on to the delicate endings of the hearing nerve, producing concussion of the nerve, or both rupture and concussion may occur. The membrane is more likely to be ruptured if it has been weakened by previous disease, such as abscess in the middle ear. The rupture of the membrane may save severe concussion of the nerve. Unless the hole produced becomes infected, it usually heals quickly and hearing returns; if, however, there is co-existent concussion, or concussion alone, the deafness may clear up to a certain extent with rest, but a permanent and incurable high degree of deafness may be established at once.

It is the heavy guns which are responsible for these forms of injury. Men firing in a barbette, or those standing behind a big gun fired in the open, are less subject to injury. The firing of guns all round is more likely to cause injury. Shells bursting on board will produce the same evil effects.

2. Repeated and Prolonged Exposure to Noise.

This, in my opinion, is the most common cause of deafness in the Navy, especially among those exclusively engaged in gunnery.

The deafness is comparable to that found so frequently in boiler makers, where a man stands inside a boiler holding on to a rivet, while the men outside hammer it in. I can assure you that the noise to the inside man is disagreeable to a degree; I know, because I have tried it. The same variety of deafness is also seen in the left ear of those who shoot much with the rifle and in sportsmen. The lesion is situated in the nervous portion of the ears, and both ears are usually affected, although one may be worse than the other. The deafness has been likened to the blindness produced by exposure of the eyes to a very bright light; the mechanism in the ear, which damps loud and disagreeable noises, soon becoming tired or overpowered.

I think it is the experience of all that the high-pitched, shrill, reverberating reports of the 6 and 12-pounders are chiefly responsible for the worst effects. The loss of function is insidious in its onset; at first complete recovery takes place after rest, but if the noise is repeated at short intervals, the return to normal becomes gradually less and less, until a high degree of loss results. It will be found that while individual conversation in a quiet room presents no difficulty, yet if there is a noise around, as in general conversation, at a dinner party or in a train, the deficiency becomes most marked. Difficulty in hearing is experienced in a church or theatre, and remarks addressed unexpectedly are often lost. If exposure is persisted in, a very high and incapacitating and permanent loss of function is sure to result.

Prevention.

We know that when gun deafness is established no power on earth can cure it, the treatment obviously then must be preventive.

It is important that in those who are to be exposed to gun fire, the ears, nose, naso-pharynx and throat should be healthy. To ensure this as far as possible, those entering the service should be carefully

examined, and any unhealthy condition rectified. "Adenoids" and enlarged tonsils, which are common in childhood and boyhood, require removal. Exposure during a cold should be avoided as far as possible.

I venture to think that from the first the danger of gun deafness should be insisted on, and instruction for its prevention should be carefully given. A boy not appreciating the danger, often thinks it is silly to take precautions, and is afraid of being accused of funking.

Although the ears, nose, and throat may be healthy, we see that the natural mechanisms, which exist for the prevention of gun deafness, are easily overpowered; therefore, we have to consider how the excessive condensation of the air and the over-stimulation produced by repeated and prolonged noise can best be prevented. The only method is to wear something in the passages which will effectually block them. Cotton wool and cotton waste are often used, but they are not sufficient. After the Russo-Japanese War, Surgeon-General Suzuki of the Japanese Navy, stated [1] that the cotton wool plugs which were served out to every man in the fleet before action were found to be inefficient. Any aural surgeon could have predicted the failure. The rubber plugs, invented by Dr. Ward Cousens, of Portsmouth, are often very satisfactory, but they have to fit very accurately. The most efficient plugging, in my opinion, is produced by the "clay fibre," originated by Sir William Dalby; it is a mixture of modelling clay and wool. A suitable amount can be rendered soft and pliable by a little manipulation; it can thereby be made to fit any passage; it gives absolute protection, and is readily removed in one piece. The material has been objected to on the score that its frequent use might permanently enlarge the passage; such an objection is absolutely groundless.

Of course, with the passage blocked, certain personal inconveniences are noticed. One's own voice sounds unnatural, one's own footsteps are unusually loud, and so forth; but these are a very small price to pay for efficient protection. A more serious objection is the difficulty of hearing orders; but, in a deafening noise, such as occurs during general gun fire, or in the interior of a boiler while rivetting is going on, it is a curious and interesting fact how easily and comfortably a slightly raised voice is heard with the ears thoroughly blocked; indeed, more easily than if they are unblocked. Dr. Barr of Glasgow first drew attention to this in an investigation he made among boiler makers, in 1886,[2] and I have verified the observation myself in the boiler factory of the London and South Western Railway Company at Millbank. I am told that orders on a battle-ship are being given more and more by signal. On the whole I think that the objection of inability to hear orders is not serious, and what difficulty does exist can easily be overcome, in peace time at all events, by signalling orders. (The amount of voice-hearing still remaining with the ears thoroughly plugged with the material, and in a quiet room, can be tested with the man who is here for the purpose.)

It is found that keeping the mouth open, or biting on some hard material, gives some relief, but these means are of subsidiary importance, and are unnecessary if the ears are efficiently plugged.

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[1] *British Medical Journal*, 28th October, 1905.

[2] Philosophical Society of Glasgow, 3rd March, 1886.

Plugging the ears with each forefinger gives perfect protection, and is a method which I think is applicable in the artillery branches of the Army, under some circumstances at all events; of its feasibility I should like to have your opinion.

Firing guns in an enclosed space is exceedingly dangerous to the ears; I see that it does occur.

A naval surgeon, in whom I have the greatest confidence, has sent me an excellent report on the hearing and condition of the ears of 50 men serving in the Navy. I am not allowed to give his name, and his report is not to be considered official. I wish to give my best thanks to the Director-General of the Naval Medical Service, for permission to use them. In testing the hearing he used a whisper at 12 feet as a standard, which is by no means a severe test, and errs on the side of leniency. I have tabulated his results, as you see. The first column of figures is my own, and will be used in referring to individual cases. The figures in the second column correspond to those in the report.

The first table consists of eight men, who did not pass the test in either ear, and in whom, as the tuning fork test clearly demonstrates to me, the deficiency is due to gun fire. The deafness was very marked in 2, 4, 7, and 8. No. 4, you will notice, has adenoids, and his deafness is probably a mixture of cattarhal and gun deafness.

Nos. 1 and 3 stated that their deafness originated while firing in a confined space with a corrugated iron roof. Under such circumstances the risk to the ears is greatly increased, and should be avoided. No. 3 evidently sustained a rupture of the right membrane. No. 7 became deaf from concussion of the hearing nerves after a single exposure to the explosion of a big gun. Nos. 1 and 2 are the only ones among the 50 who take any precaution: No. 1 bites on a piece of india rubber; and No. 2 wears cotton wool in the ears. You will notice that some of the men say that gun fire makes no difference to them, and that they were not aware of any deficiency. In connection with this I should like to say that a deficiency of any sort is more felt among the cultured than among the class from which the seamen are drawn.

The second table includes those who were unable to pass the test with one ear, and No. 9, giving a total of 17 men, whose hearing has been affected in one or both ears.

The third table numbers 11, and comprises those who were able to pass the test, but who complained of either temporary deafness or noises (or both) after firing. No. 19, although passing the test, stated that he had been hard of hearing to speech for 18 months, and that he always suffered from noises after firing; this case demonstrates the leniency of the test. No. 21 is a third in the series who complains of the effect of gun fire in a confined space.

It will be seen that the small quick-firing guns are chiefly accused.

If we add the three tables together we see that 28 men out of the 50 are affected in some way, temporarily or permanently, by gun fire, and run a special risk of becoming more or less deaf.

In Table 4 are placed seven men who were deaf in one or both ears, the cause being other than gun fire. No. 35 has a perforation in each membrane, and says that he hears better after gun fire, which is within the realm of possibility. Table 5 is composed of 15 men who are unaffected in any way.

A report on the examination of the hearing and condition of the ears of 50 naval seamen:—

TABLE I.

Those unable to hear a whisper at 12 feet with either ear.

No.	No. in Report.	Rating.	Age.	Right ear.	Left ear.	Remarks.
1	2	Sight-setter ...	26	10 feet	6 feet	Deafness said to be due to firing of 6-pounder in a hall with corrugated iron roof. Keeps piece of india-rubber between teeth during gunfire.
2	3	No. 2 gun's crew	29	6 inches	8 feet	Perforation in membrane flaccida right, wears cotton wool.
3	8	Sight-setter ...	28	3 feet	10 feet	Six years' deaf after firing 3-pdr. in a corrugated shelter in barracks. Right ear bled. Has felt deaf after firing in the ear since.
8 4	21	Stoker	21	6 feet	2 inches	Perforation left membrane not due to gunfire. Adenoids.
5	24	Gun-layer ...	36	3 feet	8 feet	Had not noticed firing make any difference.
6	28	Gun-layer ...	26	10 feet	2 feet	Deafness noticed 3 years had not noticed firing make any difference.
7	31	Sight-setter ...	27	2 inches	3 feet	Very deaf 9 years, came on while standing alongside barbette of 13·5-inch gun when it was fired on H.M.S. "Empress of India."
8	50	Gunner... ...	23	2 feet	8 feet	Deaf for 2 months after firing 3-pdrs. was unable to hear for 1 week after firing.

TABLE II.

Those unable to hear a whisper at 12 feet with one ear.

No.	No. in Report.	Rating.	Age.	Right ear.	Left ear.	Remarks.
9	12	No. 6 in gun's crew	22	7 feet	12 feet	Had not noticed firing make any difference.
10	17	Sight-setter ...	25	12 feet	3 feet	Was almost stone deaf for 2 days after last gunfire.
5 11	18	Gun-layer ...	31	10 feet	12 feet	Always deaf for 1 or 2 hours after firing 3- and 6-pounders.
12	20	Captain of turret	37	12 feet	8 feet	Had not noticed firing make any difference.
13	26	Gunnery Instructor. Captain of turret	32	10 feet	12 feet	Had not noticed firing make any difference.

TABLE II.—*continued.*

	No.	No. in Report.	Rating.	Age.	Right ear.	Left ear.	Remarks.
4	14	37	Sight-setter ...	28	12 feet	3 feet	Always deaf for 2 days after firing.
	15	42	No. 2 gun's crew	30	6 feet	12 feet	Had not noticed firing make any difference.
	16	44	No. 2 gun's crew	30	12 feet	7 feet	Had not noticed firing make any difference.
	17	45	No. 3 gun's crew	24	10 feet	12 feet	Had not noticed firing make any difference.

TABLE III.

Those who were able to hear a whisper at 12 feet with both ears, but who stated that gunfire gave them some trouble.

	No.	No. in Report.	Rating.	Age	Remarks.
11	18	9	Bugler	17	Has noticed ringing in the ears after gun-firing. Stationed on fore-bridge.
	19	16	Civilian in Sick bay under fore turret during firing	32	Although passing the test has noticed difficulty of hearing speech for 18 months, always marked noises in the ears after firing.
	20	22	Torpedo Man ...	27	Although passing the test stated he was deaf after the firing of 6-pounders while he was at the wheel of a destroyer 6 months previously ? Malingerer.
	21	23	Gun-layer ..	22	Has noticed some deafness for 2 days after firing 3-pounders under iron roof in shed at Eastney.
	22	25	Gun-layer ...	32	Is deaf with noises in the ears for from 6 to 8 hours after firing with small Q.F. guns.
	23	33	Gunnery Instructor. Captain of turret	28	Often deaf for 2 or 3 days after firing 3-pounders.
	24	34	Gun-layer ...	31	Always feels deaf for 2 hours after firing 3-pounders.
	25	35	Gun-layer ...	25	Always dull after firing.
	26	41	Gun-setter ...	26	Always deaf for 2 hours after firing.
	27	47	No. 3 gun's crew	26	Singing in the ears for from 6 to 8 hours after firing small Q.F. guns.
	28	49	No. 2 gun's crew	24	Deaf for half-hour after firing small Q.F. guns.

TABLE IV.

Those unable to hear a whisper at 12 feet with one or both ears, but deafness not due to gunfire.

	No.	No. in Report.	Rating.	Age.	Right ear.	Left ear.	Remarks.
7	29	1	Sick berth attendant	27	8 feet	12 feet	Perforation in right membrane.
	30	4	No. 2 gun's crew	30	7 feet	7 feet	Middle ear catarrh. Membranes indrawn.
	31	5	Seaman gunner	24	3 feet	3 feet	Cause not stated. Does not form one of a gun's crew.
	32	10	Stoker	20	1 foot	9 feet	Wax right ear. Has never done any firing except with a Lee-Metford.
	33	14	Gun-layer ...	28	12 feet	10 feet	Wax left ear.
	34	15	Ord. seaman ...	19	7 feet	12 feet	Has often felt deaf and stupid after gunfire. Cause, right ear unknown.
	35	27	Gun-layer ...	29	6 feet	12 feet	Perforation in both membranes with discharge since a child. *Says he hears bells after gunfire.*

TABLE V.

Those who had nothing wrong with their ears, and who stated that firing did not trouble them at all.

	No.	No. in Report.	Rating.	Age.	Remarks.
15	36	6	Gun-setter ...	27	
	37	7	Gun-layer ...	26	
	38	11	No. 3	29	
	39	13	Sight-setter 6in.	26	
	40	19	Gun-layer ..	26	
	41	29	" ...	25	
	42	30	" ...	25	
	43	32	" ...	22	
	44	36	Sight-setter ...	26	
	45	38	" ...	24	
	46	39	Gun-layer ...	24	
	47	40	Sight-setter ...	26	
	48	43	No. 2	29	
	49	46	"	23	
— 50	50	48	No. 3	23	

Fleet-Surgeon Lloyd Thomas, R.N.:—I should like to ask Mr. Cheatle, who has given us such an interesting lecture, whether he has, in the course of his observations, remarked any changes in the loss of sounds conveyed, such sounds as have been acquired by the individual, *e.g.*, in the case of doctors, heart sounds; in musicians, notes of music?

Mr. CHEATLE:—Do you mean tinnitus?

Fleet-Surgeon THOMAS:—I mean acquired sounds, such, for instance, as the notes of a piano, or sounds that we as surgeons and doctors have to look for with a stethoscope when examining the chest. I should be very glad if he would say whether it has come under his observation that those acquired sounds have been affected because naval surgeons have told me, quite frequently, that they had lost the power of diagnosis with the stethoscope after being exposed to big-gun firing. Mr. Cheatle has also very kindly passed round for our inspection the plug which he considers it is best in the circumstances to use on board-ship or among artillery officers and men. Mr. Cheatle will excuse me if I disagree with him on that particular point, and purely on a point of technique. He told us, in the course of his remarks, that the chain of bones across the drum through the middle ear by being set ajar frequently damage the terminals of the nerves by their being made rigid. I suggest that, in the same way, if the outer ear is blocked with that doughy substance instead of a softer and more porous material, such as simple cotton wool, that it would make a rigid airless medium, almost solid. I understand that the man whose ears Mr. Cheatle has experimented with were fairly blocked, so that the outer ear cavity was almost like bone, and the tendency with regard to that would be that it would be just like wood. I suggest that for your consideration, and, in opposition, I recommend the use of cotton wool, which is porous, and will also transmit the broken sounds.

Lieutenant G. GIPPS, R.N.:—I understood the lecturer to say, in the course of his interesting remarks, that he dealt entirely with sound vibration. There are two questions I would like to ask him. In the first place, I should like to know what is the effect of blast on the ears. In the second place, Mr. Cheatle said that if you knew a noise was coming you could prepare for it to a certain extent. I have noticed that, if I am firing a gun, I get no ill-effects at all; but if, on the other hand, I am conducting a practice and standing behind a gun, or on one side of it, then I can feel the sound very much more. I should like to ask him further whether, when you press the trigger, and you know the exact moment the noise is coming, there is any special function of the nerves which is able to compete with the sound?

Colonel L. T. PEASE, R.M.A.:—I think the lecturer, in the interesting remarks he has made to-day, has rather upset a good deal of what has been done in this direction of late. Experiments have been carried out with a view to get some protection for the ears, which would admit of the passage of voice waves and protect them from the blast waves. Those two waves are, of course, of a very different order. The instruments that have been designed and brought out are roughly of two forms. One form is composed of separated perforated discs, which the voice waves are not sufficient to bring together, whereas the blast waves are powerful enough to bring them together, and thus close the passage. The other system is by having both the voice waves and the blast waves passing along a narrow passage which has very sharp changes of direction. A voice wave will travel round these curves easily, but a blast wave, owing to its different nature, is brought up, and, to a very great extent, destroyed. The latter form appears to be the more satisfactory, possibly from it being a much easier thing to fit into the ear. Great difficulty has been experienced with all instruments in fitting. The second instrument I mentioned, which I will call the tube instrument, is quite easily fitted

into a skeleton frame, whereas the other one has to partake of the nature of a plug. I mention that specially, because having made a good many experiments with different devices, it appears to me that anything in the form of a plug is uncomfortable, whereas a frame fitting is very light and very rigid. But there again a difficulty presents itself, because it must fit well. I was very much surprised, when I came to look into the question, to discover the enormous number of different shapes that the interior of the ear takes in different people. With half-a-dozen sizes you probably could not fit twenty-five people of about the same build. I have mentioned this point specially, because, as far as I can see, the lecturer having produced this plug will do away with any necessity for having experimented at all in this way. We all saw that the man he experimented upon answered three questions which were put to him. I have never come across any wool plug that would admit of an individual hearing like that man did. I do not know how it is that the mixing up of the clay with wool assists in the hearing, except, as was suggested just now, that possibly it may be that the clay conducts sound waves. I am afraid I cannot speak very feelingly on this subject, as I have had as much experience probably as any officer in the Service in gun-firing, and I am not deaf in the slightest, but I may be the exception that proves the rule. From what I have heard to-day would lead one to think that protection is absolutely necessary, and that will give one a little more zest in endeavouring to discover something that will be effective. These particular instruments I have mentioned are made by Elliott's. They were first introduced into the American Navy, and are now in considerable use there. They have also been tried in our own Navy. It might interest the lecturer to know, being a medical man, that I have heard of three cases where cotton wool has been a source of great trouble. A portion of the wool remains behind, gets very hard owing to the wax in the ear, and in these three cases the men suffered considerably from it. It was only by repeated syringing that the wool was got out, when it was found to be in very hard lumps.

Captain K. D. HUTCHISON, R.A. :—I think many officers present would be glad if Mr. Cheatle will let us know where the modelling clay plug that he has passed round can be obtained, and particulars as to its price, so that we may be able to get it if we want to use it. I should also like to say that, as far as my experience goes, it is certainly the lighter guns, the 6 and 12-pounders, and so on, that make people deaf. The only time I have ever suffered from deafness was when a gun went off rather unexpectedly. I went down to the gun floor to inspect a gun which had mis-fired, and the gun next to it went off, rather to my surprise, and as a result I was deaf for two days. I have never on any other occasion been deaf. I have used cotton wool with very good effects, although Mr. Cheatle has told us that appparently cotton wool is not altogether satisfactory.

Mr. CHEATLE, in reply, said :—Fleet-Surgeon Thomas asked me whether doctors have experienced difficulty in hearing heart and breath sounds as a result of exposure to gun fire. I have not heard complaints from naval surgeons, but it is more than likely that a surgeon would be unable to detect the fine differences from the normal, both in the heart and lungs, if he is "gun deaf." I should like to point out to him that the clay fibre does not become hard in the ear passage; in fact, it can be used over and over again. And of course, the material is not pushed in right on to the

membrane, but there is always a space containing air between the plug and the membrane. He recommends cotton wool, which certainly gives a certain amount of protection; but there is no getting over the fact that cotton wool plugs were thoroughly tried by the Japanese in the late war, and Baron Nozuki distinctly stated they were found to be inefficient, and that the subject required further investigation. Colonel Pease's remarks are of the greatest interest to me, but I think that any instrument which leaves a space will not efficiently prevent the effects of the blast. I can thoroughly sympathise with him in his difficulty of making an instrument which will fit all ears; such a thing is impossible, as there is so much variety in shape and size. The clay fibre can be made to fit any ear. I have a perfectly open mind on the subject, and would welcome any more efficient device; but at present I know nothing better than the clay fibre. It can be obtained at Hawkesley's, 357, Oxford Street.

The CHAIRMAN (Colonel J. H. Bor, C.M.G., A.D.C., R.M.A.):—The lecture has been such a technical one that there is not much room for remarks from mere laymen. I think that all artillery officers and gunnery experts will agree that concussions from light guns are much more hurtful than those from heavy guns. As far as the bursting of shells on board-ship is concerned, I daresay that will be worse for the enemy than it will be for us. I think two great practical points have been brought out by the lecturer. First of all, he accentuated the importance of all artillery and gunnery officers, impressing on their subordinates the importance of taking precautions against gun deafness. The second practical point is, that it has been inferred that the most perfect protection has not yet been invented, and that here is still room for an inventor to bring out a perfect invention. In conclusion, it only remains for me to propose a very hearty vote of thanks to the lecturer for his interesting lecture, which I hope will have the effect of drawing attention to this important subject. I know that its importance has not been lost sight of by gunnery officers, especially in the Navy and the Royal Artillery on shore, but I hope the lecture will have the effect of accentuating the importance of paying attention to it.

MODERN TENDENCIES IN STRATEGY AND TACTICS AS SHOWN IN CAMPAIGNS IN THE FAR EAST.

By Lieut.-Colonel YODA, Imp. Japanese Army.

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Communicated by the General Staff.

THE wars in which Japan has recently been engaged, the Chinese and Russian campaigns and the Boxer trouble, provide one with many excellent strategical and tactical examples. If these be collected and classified, and compared with the recent great wars in Europe, of 1866, 1870-1, 1877-8, we find that they are in no way inferior to the latter in abundance and real substance of material for study. Especially the use of the latest weapons and sciences in the war with Russia, and the employment of large forces, have given us much experience that is new. Further, joint operations of army and navy, landing operations, and the co-operation of men-of-war in land engagements, have occurred for the first time in the Far East.

For convenience of discussion I have divided the subject into the following heads:—

1. The development of modes of transport and the employment of large numbers.
2. Development of means of communication and decrease of independent action.
3. Decrease of strategy of a subtle or intricate kind, and increase of a large type of strategic movements.
4. Closer co-operation between army and navy.
5. Extension of the battle front and increase of the distance at which engagements are opened.
6. Adoption of entrenched positions and increase in the duration of an action.
7. Prevalence of enveloping attacks to the exclusion of frontal assaults, and the necessity for a fundamental method of deployment for battle.
8. Increase of the cases when reconnaissance is made in force.
9. Decrease in the distinctive character of fortress as opposed to field warfare.
10. Increase of the use of night for operations.

1. THE DEVELOPMENT OF THE MODES OF TRANSPORT AND THE EMPLOYMENT OF LARGE NUMBERS.

Formerly, when horses and wagons were the only means of transport, large forces could not be collected at a distance from their base

owing to the difficulties of supply, and this was especially the case when the theatre of war was subject to extreme cold. Even in the rich and fertile plains of Europe the cases of assembly on one battle-field of over 200,000 men on one side are very rare in history.

Although, at the battle of Dresden, 26th-27th August, 1813, the combined Armies of Austria, Prussia, and Russia reached 200,000; yet they were only two or three days' march from their base of supplies. At the battle of Leipzig of the same year, the combined Armies of Austria, Prussia, Russia, and Sweden numbered 300,000, but they did not advance on the same line, and united from three directions, S., N., and E. Again, Napoleon assembled 400,000 or 500,000 men on the Vistula against Russia, in June, 1812, yet he quartered them over a wide front, over 290 miles in extent; he invaded Russia in several columns, and was never again able to collect all his force together.

With the adoption of railways for military purposes, the number of men brought into the field was suddenly increased. At the battle of Koniggrätz, 1866, about 220,000 troops were employed on each side. In this war practically the whole of the forces on both sides were concentrated (Prussia, 290,000, Northern Army of Austria, 260,000).

To concentrate her Army on the frontier Prussia used four lines of railway, each railway conveying about one army corps. However, after entering the enemy's territory, and up to the battle-field, the railway service had to be discontinued. The number of trains per day on each line did not exceed from 8-12. (The Austrians used one line of railway up to the front, and established there a large provision depôt.)

At the beginning of the war of 1870-1871, the Germans numbered 380,000, the French, about 250,000; but the numbers on each side gradually increased, so that at the truce in April, 1871, there were 630,000 Germans, and over 530,000 French in the field. The operations were scattered, and the greatest number in one engagement, namely, at Gravelotte and St. Privat, were 187,000 Germans and 113,000 French. In siege operations there were 197,000 Germans in the investment of Metz, and 200,000 surrounded Paris. The Germans concentrated their troops on the Rhine by means of six lines of railway, and after entering France they were fed by one, and subsequently two lines, leading straight to the rear. At the same time it must be remembered that the operations were in a fertile country, and, unless a prolonged stay was made in one place, the Germans were chiefly dependent on the enemy's supplies. The railways of this period carried, double lines, 18 trains per day, single lines, 12 trains per day, each train consisting of 120 carriages.

The Russo-Japanese is the first war in the Far East in which railways have been used at the seat of war. At the Sha-Ho, about 200,000, and at Mukden, about 300,000 men, were assembled on each side, and before the truce Russia had concentrated 18 army corps, about 600,000 men, near Feng-hua and Kuo-chia-tien, and Japan had concentrated an army to oppose these. In order to concentrate and supply these forces, both sides were dependent on a single line of railway. This was especially noteworthy in the case of Russia, which had to depend on its immensely prolonged Siberian line (carrying at first only 7 trains a day, afterwards increased to 17-18, of which 10-13 only were for military purposes), and which had to supply a line at right angles to its direction. The Russians, however, requisitioned the greater part of their food supplies in Manchuria.

Examples, as the above, clearly demonstrate the gradual increase of the strength which can be brought into the field which has accompanied the development of modes of transport. The idea that one line of railway could not supply 250,000 men became out of date. To day it is not impossible to run 40 or 50 trains on a double line, and 24 or 25 trains on a single line in a day; it should, therefore, be possible to move over 500,000 men by a single line, and it is easy to see that we shall be able to concentrate larger forces in the future, as improvements in rolling stocks, etc., increase the carrying capacity of a train.

Some people say that the time will come, when lack of funds and material will put a limit to the size of an army, that a few daring troops, carefully selected and trained, are preferable to these enormous masses. The maximum that a state can put into the field is all its young men who can bear arms, but the method of conscription obtaining affect the proportions of these that are availed of. Except in France and Germany, and a few other States, the majority of the young men do not serve in the ranks, and this limit is still very far from being reached. Further, with the improvements in arts and sciences, and the gradual increase of national resources, the handling of large numbers will become easier. In conclusion, we cannot yet see the time which the above critics say will arrive, when the limit to the size of an army will be reached, and a reaction will cause a reduction of military organisations.

I have alluded only to railways, but as regards transport by sea, the increase in number, tonnage, and speed of ships, improvements in navigation, and the construction of harbours, have facilitated the transport of a large force. In the Japan-China War only $1\frac{1}{2}$ divisions could be sent to the Yalu, owing to ignorance of the course and lack of ships. In the late war we were able to send 3 divisions, owing to the improvement in the *etappen* service, and, more especially, to better use of the sea route.

Besides the above, automobiles, light railways, and electric cars have already been, or seem likely to be, adopted for conveyance in war.

We see, therefore, that the development of transport facilities will cause the employment of increasingly large numbers in the field, and it becomes more than ever necessary to improve military preparations, military organisation, training, and means of transport.

2. Development of Means of Communication and Decrease of Independent Action.

Before the discovery of the telegraph, horses were the only means of communication. Leaders were obliged to concentrate their forces as much as possible, so as to have them at their disposal when needed. Unless it was unavoidable, troops were never detached, as the most rapid means of communicating with them was by orderly.

At this period it was considered best that the general in command should himself view the situation from the main position, and then issue the necessary orders to his generals. This method was not only quicker than orders based on reports, but gave more certainty of a correct and suitable appreciation of the situation.

For these reasons the commander-in-chief would ride about in every direction, and even appear in the front line. For instance, Napoleon's rapid decisions were arrived at in this way. Relays of horses were posted every 6 or 9 miles, and he was thus able to cover 80 miles in six hours and a half. Still, it was difficult to retain control over the whole of his force, and he was sometimes obliged to leave important decisions to his generals. Latterly, when the size of his armies grew with the increase of his power, his generals became accustomed never to move without his orders. This caused his downfall; for the employment of large numbers more than ever necessitates the delegation of control.

The use of the telegraph has made it much easier to retain control of a large force. This fact was demonstrated in the Franco-German War. Towards the end of the latter, the German Headquarters at Versailles were informed daily of the situation in different parts of the field, and issued their orders by means of the telegraph. There was no necessity, as formerly, to constantly shift the position of headquarters. While it was possible to maintain communication with the rear of the fighting troops by means of the telegraph, owing to its somewhat "fixed" nature at that date, on the battle-field, or while troops were in motion, there was still no other way but by orderly. Owing to the numbers engaged, subordinate leaders were often called upon to take independent action, and the natural readiness of German officers to act on their own initiative provided a number of instances.

Since then means of communication have improved, the telegraph and telephone have been used on the battle-field, balloons have been used for reconnaissance and communication, wireless telegraphy and various means of signalling have been introduced, automobiles have done the work of orderlies.

The employment of large masses, the semi-permanent occupation of artificially prepared positions, the elapse of several days before the result is decided, all these reasons necessitate means of communication between the several corps and detachments, and a network of telegraph and telephone lines is the result.

No need for personal initiative by subordinate leaders arises, their movements are brought under the single control of the commander-in-chief. This phenomenon was witnessed in the Russo-Japanese War, the commander-in-chief, stationed at a central point, constantly receiving reports from different parts of the field, and issuing his orders accordingly. Further, the necessity for riding about in every direction disappeared.

Where the operations have a single objective, independent action is, if possible, to be avoided, but on the battle-field cases arise requiring prompt decision, and where there is no time to refer matters, as they occur, to superior authority. Also, when a force is in movement, when time does not allow the establishment of a telegraphic line, or when a breakdown occurs, these are cases that call for the exercise of independent initiative.

We cannot regard the continuance of a battle for 10 days or more, in an established position, as occurred in the late war, as a normal precedent. In the future, there will still be great need for personal initiative, and in the training of officers this must be kept in view. Independence is allied in character to enterprise, and is directly opposed to hesitation and decision; it is especially valuable before

the enemy to have the spirit of initiative, and the object of future training should be, more than ever, to develop it.

The scattered nature and long duration of modern fighting, including its preparation and conduct in varying situations, increasingly require the development in junior officers and men of a clear perception of their duties and a spirit of initiative. (The frequent failure in the performance of orderly duties is due, to some extent, to the range and precision of modern firearms, but individual lack of intelligence is also at fault. Duties, such as those of orderlies, entirely depend, for their performance, on the personal intelligence of the private.)

We see from the above that, while the independent control of large forces has decreased with the development of means of communication, the necessity for initiative and independent action, within small limits, has very much increased and must be cultivated in the future. The study of a means of communication with forces on the move is now a pressing requirement. The Russians organised a wireless telegraph detachment towards the end of the war, and they have lately established a mounted telegraph section with the undoubted object of developing this mode of communication on the battle-field.

The development and improvement of the pulse of the army—communication—are urgently required.

3. Decrease of Strategy of a Subtle or Intricate Kind and Increase of a Large Type of Strategic Action.

The concentration and supply of armies in war is dependent on the railway, and as railway construction is performed in peace, the direction of concentration in war is fixed, and large forces are unable to move far away from the line.

In the China-Japan War, where no railway existed in the field, there were many different strategical developments; but, in the Manchurian campaign, if we except the fighting in the mountainous country previous to the battle of Liao-yang, the operations were up and down the line. While this was due to the ground, to the single line of railway, and to the special tactics of the opponents, a principal cause was that the enormous masses of men could not be supplied at a distance from the railway. For these reasons, we see that a pursuit, or driving operations, cannot be pressed with speed with a very large force. While there are several reasons why there were no big pursuits in the late war, one is, that a large force cannot be moved freely.

Railways traverse Europe in every direction, and this introduces certain modifications; but extension of railway systems increases the chances of breakdown and demolition, and adds to the difficulties of the rapid transport of large forces by rail.

Again, the introduction of the telegraph has made a surprise attack on the enemy a matter of great difficulty. While on one hand both sides are rapidly informed of the situation, the rate of marching of an army remains unchanged, and so the enemy is advised while the movement is in progress; on the other hand, parties at a distance can be rapidly given an objective, and time is saved in preparations. Moreover, the telegraph connects the countries of the belligerents with neutral states, and news of events at the seat of war become, in a

few hours, the property of the world. Operation of large forces, unknown to the enemy, can hardly be carried out. Only by strict guardianship of secrets, both in the field and at home, may public knowledge of the actual facts be confined to a surmise that some such movement is taking place.

For reasons as above, and because of the increased importance in the utilisation of ground features against the perfected firearms of to-day, collisions between forces on the march (which have not yet deployed) will hardly occur. The occasions when both sides possess the same numbers, character and moral in any engagement are rare, and one side or the other, being now rapidly informed of the condition of the enemy, will seek to remedy its inferiority by dispositions on the ground. In minor engagements, however, collisions between detachments in marching formation are likely to occur, as before.

We see, then, that the two great developments of transportation and communication have caused a decrease in strategy of a brilliant or intricate kind; but, at the same time, improvement of means of communication has made easier concentrating movements or enveloping operations, which formerly were considered strategically dangerous.

In the age of Napoleon, as there was no telegraph, operations on interior lines were considered the proper course; concentration could be more rapidly effected, and the enemy taken in detail. It was one of Napoleon's principles, never to concentrate a scattered force in front of the enemy. To-day, forces that are scattered, are enabled to be in complete telegraphic or signalling communication, and need not, as formerly, face an emergency unsupported.

Envelopment can be more perfectly and easily carried out, and, in addition, the modern firearm necessitates the construction of entrenched positions, the battle is of a more obstinate nature, and tends to last several days. Consequently, the army that is on interior lines, before it can overthrow the enemy in one direction, is in danger of the approach of his forces from others, and further, the scattered nature of the modern battle formation does not lend itself to rapid withdrawal.

Reasoning from the above, we find that to-day strategic envelopment is the best method of operations, and, further, that strategic envelopment enables a large force to be split up, and therefore provisioned with greater ease. In other words, divide to march, unite to fight!

While these observations apply generally, the possibility of strategic envelopment depends on the nature and position of railways and landing places, and is not possible under all circumstances; and also the danger of division has decreased, but has not disappeared.

The improvement in means of transport have immensely facilitated operations at a distance from home, and the transport of large numbers to long distances from their base in recent campaigns are striking instances of this.

In conclusion, we see that brilliant or skilful strategy is more or less a thing of the past, and that its place has been taken by strategic operations on a large scale. But, as has been pointed out, one of the objects of training must be to cultivate initiative and independence of action, and to study the different phases of the battlefield.

4 INCREASE OF CASES OF COMBINED OPERATIONS OF ARMY AND NAVY.

Formerly, before the thorough development of communications, arms, or vessels, military and naval warfare were quite distinct, and joint action was unknown. To-day, the improvements in artillery *matériel* enable vessels, that are some distance from the shore, to fire on an object on land. Many instances of this occurred in the China-Japan and Russo-Japanese Wars. Also, at river-mouths or in rivers, torpedo or gun-boats have frequently taken part in the operations on shore.

Although, in the Japan-China War, owing to ignorance of the Channel and lack of suitable vessels, the fleet did not take part in the battle of the Yalu, in the Russo-Japanese campaign two gun-boats, two torpedo-boats, and two armed steam-boats took part in the engagement at that place.

Since the recent introduction of wireless telegraphy, combined operations between army and navy have been much facilitated. Formerly communications to, and inside, the fleet could only be effected by signalling, which was frequently impracticable owing to fog.

Now that has changed, and orders or reports can be transmitted at any time and at considerable distances, a fact that must have a great influence on naval strategy and on combined sea and land operations. The development of submarines, torpedo-boats, and submarine mines have had a great influence on the attack of the coast or harbours by war vessels, and considerably handicapped the latter, necessitating the mutual assistance of army and navy.

5. EXTENSION OF THE BATTLE FRONT, AND INCREASE OF THE RANGE AT WHICH ENGAGEMENTS ARE OPENED.

With the increase in power and precision of modern weapons, as the battle line has become thinner, so has its extent increased. To take examples from campaigns, we find, during the period of the single loading rifle, as follows:—

At the battle of Koniggrätz (1866) 13½ men to each pace of front.

Calculating the strength of each army as 220,000, the battle front as 7½ miles, and each division as 10,000 men, we find that the average front of a division is 550 yards.

At the battle of Gravelotte and St. Privat there were about 9 Germans and 5 French to each pace.

The German Army numbered 187,000; the French, 113,000; the battle front extended for about 11 miles; putting each division at 10,000 men, the average length of front for which each division was responsible was: Germans, 930 yards; French, 1,540 yards.

At the battle of Tien-chang-tai, in the Japan-China War, the Japanese averaged ·8 men; the Chinese 2·4 men per pace.

The Japanese Army numbered 109,000; the Chinese, 20,000; the extent of front was from 3¾ to 5 miles; each division was responsible for: Japanese, 4,620 yards; Chinese, 3,300 yards.

After the introduction of the magazine rifle, examples show, as follows:—

At the battle of Pei-tsang, during the Boxer trouble; here the fighting took place almost entirely on the right bank of the Peiho. Putting the forces of the allied nations at 13,000, the front at 3 miles,

and a division at 10,000 men; the front of a division works out at 3,850 yards.

At the battle of Liao-yang to each pace there were about 2·75 Japanese and 3·75 Russians. As the right bank of the Tai-tzuho was completely separated, account is only taken of the fighting on the W. and S. of Liao-yang. Here the Japanese numbered about 106,700, and the Russians about 150,000; the front stretched for 16½ miles. Calculating each division as 10,000, the front of a division comes to: Japanese, about 2,900 yards; Russian, about 1,980 yards.

At the battle of the Sha-Ho there were about 2¼ Japanese and 3¾ Russians to each pace; the figures are:—

Total Engaged.		Battle Front.	Division.	Front of a Division.	
Japanese.	Russian.			Japanese.	Russian.
148,000	257,000	30 miles.	10,000	3,700 yds.	Under 2,200 yds.

At the battle of Mukden to one pace of front: Japanese (about), 1·8 men; Russians (about), 1·55 men. Leaving out the army of the Yalu, which operated independently, the figures are as follows:—

Total Engaged.		Battle Front.	Division.	Front of a Division.	
Japanese.	Russian.			Japanese.	Russian.
247,000	336,000	60 miles.	10,000	4,400 yds.	3,300 yds.

While totals have been taken in the above calculations (*i.e.*, infantry, cavalry, and artillery have all been included), and more detailed examination would alter the figures to a certain extent, they show, beyond any doubt, that the battle front in modern engagements has been immensely increased. And, generally speaking, the battle front of the Japanese, compared with European armies, is thinner, due principally to the fact that the Japanese soldier is superior, man for man, to the enemy he has been opposed to.

Limiting the practical illustrations to the above, I will now discuss, theoretically, the cause of this extension of front.

The power of the modern magazine rifle is 4 or 5 times as great as the old single loading rifle, as, for instance, the needle gun used by the Germans in 1866 and 1870. We may say, therefore, that the fire of a single skirmisher to-day is equivalent to that of 4 or 5 times in those campaigns, and, consequently, the front held by 12 to 18 men formerly, requires, now, only 2 or 4 men to develop the same amount of fire. But if, in the face of this fire, the enemy has succeeded in getting within close range, the difficulties of assault from thence have in no way diminished. Simply, to take infantry, the same numbers are enabled to hold 4 or 5 times the extent of front as formerly; and, with the further increase in rate of fire, flatness of trajectory, use of machine guns, and improvement of artillery, this amount is likely to further considerable increase. Still, the necessity for a sufficient volume of fire to withstand assault, or, in attack, to develop a superiority of fire over the enemy, or men to take the place of losses; all these put a natural limit to the indefinite extension of the front.

The precision and power of the modern weapon have also caused an increase in the range at which a battle is opened. In the 1866 and 1870 campaigns, engagements were opened at about 2,000 metres, this being considered the limit of effective range for artillery, while the range at which infantry fire was exchanged was generally within 700 or 800 metres.

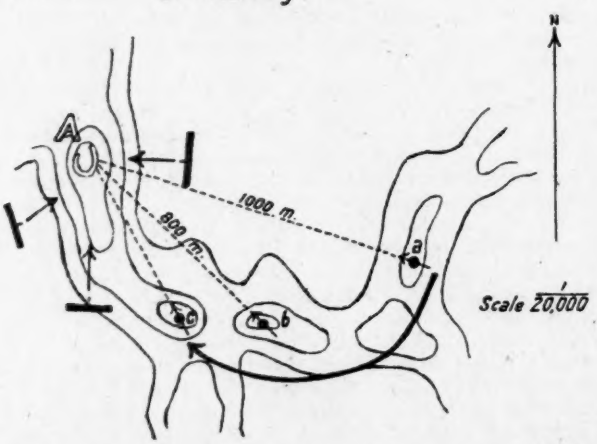
As regards campaigns in the Far East, in the Japan-China War, no marked change took place; but in the late war, the range at which the battle opened was increased to 3,000 or 4,000 yards; while shells sometimes travelled 6,000 or 7,000 yards. While, formerly, the rifle was considered ineffective over 1,000 yards, in the last war up to 1,500 yards was found effective for infantry, and rifle fire at 2,000 yards was occasionally used.

Those who argue that the power of sight puts a limit to the range at which a rifle can be laid, forget that the advance of science enables the range of vision to be increased by artificial adjuncts, and we may expect not only artillery, but rifles also, to be fitted with telescopic sights of increasing power. This shows that the limit at which a battle is opened has not yet been reached.

The endeavour of the attacker is, as formerly, to open fire at short range, but as the defender's aim is to gain fire effect at long range, the assailant is obliged, in reply, to commence an action at a range which, as we have seen, modern firearms have made so considerable.

The time taken to consummate the modern attack is so long, and the fear of checks on the way so great, that it is necessary to cultivate

The Position on the left of CH'ING-HO-CH'ENG *MAP I.*
24th February



an unquenchable spirit of attack, and to avoid all but essential demands on the strength of the troops. The chief and unavoidable cause of the prolonged nature of the battles in the late war, and the amount of ammunition that was expended, was the long range at which fire was opened.

The increase of range at which an action is opened is connected with the extension of front; that is, one cause of this increase of range is the increase in extent of front. After fire has been opened, a long time must now elapse before the assailant can carry out the decisive attack, and during that time the defender is able, with his reserves, to extend his front; and, in the same way, the attacker will not from the first push forward a thick skirmishing line, but will gradually

increase it, in order to diminish his losses and also to develop a superiority of fire over the enemy. Thus the balance of superiority will sway from side to side until the forces approach each other, and one side gives way. Still, we find (not only in the late war) many occasions at the last moment of the assault, when the result is decided, not by the virtue of the firearm, but by the bayonet; by sheer strength and weight of numbers. On the battle-field against an enemy who has not been broken, it is necessary to resort to extreme and overwhelming measures, and, regardless of losses, to pierce the enemy's position. Again, at night, or in woods, or in fog, the occasions when charges will be made at short range will not be infrequent. Even on open ground the necessity for *moral*, to endure the hail of bullets, the stress and doubtings of the battle-field, is as great as ever.

Decisive results from fire action alone will not happen unless the opposing forces are altogether unequal in nature. In the China-Japan War, the use of the bayonet or lance was very rare, while in the late war the use of both was frequent.

The naming of 500-600 yards, or 700-800 yards, as the "decisive" range, and the view, that within those limits an action is decided by fire alone, is without foundation. Within the effective range of the modern rifle, up to the moment of the assault, all ranges are "decisive"; results depend on the ground and the enemy, and it is impossible to lay down a "decisive" range definitely for all cases.

Not only is the *arme blanche* not relegated to the past, but in order to foster the spirit of attack, bayonet and sword exercise must be practised, and the fact impressed on each soldier that he will be called upon to use them in war. Moreover, the troops who possess the desire to get at the enemy with cold steel, retain their *élan*, regardless of the enemy's fire, up to the last moment.

The hardships and duration of the battle of to-day require, more than ever, a fierce spirit of attack.

6. Adoption of Entrenched Positions, and Increase in the Duration of an Action.

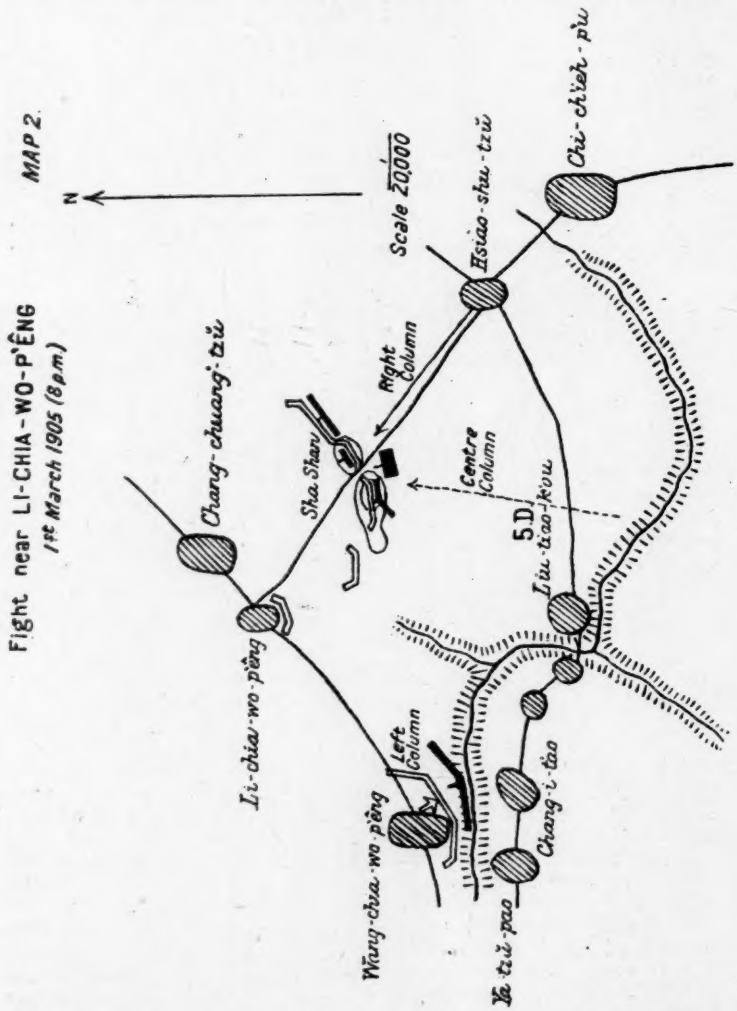
To protect the body against bullet and shell it is necessary to supplement natural objects by artificial means. And, as mentioned above, owing to the extension of the front, an army will not confine itself to a single feature, but will extend over various natures of ground, the weak points in which will require artificial strengthening.

Again, with the development of firearms and communications, the side on the defensive will usually prepare important points on the line of retreat beforehand, and will retire on them in succession.

Also, the increase in the range at which fire is opened, and the consequent length of the engagement, provides time for the construction of works, both by the defence and by the attack. In the former it will be utilised to strengthen the works; in the latter, to diminish losses and to give increased facilities for fire during the stages of the advance.

The adoption of entrenched positions has made an engagement of a more stubborn nature, has necessitated (1) heavier artillery; (2) the use of night to approach the position; or (3) flank or enveloping operations.

The battle does not occupy one day, but several; especially since the employment of large bodies, the movements of reserves, and the extension of the front take considerable time. Again, the front being relatively strong, flanking or enveloping operations give best chance of success; still, even if one flank is driven back, the fate of the whole



line is not, thereby, necessarily decided; fresh reserves are pushed up and the battle renewed, and it is not until several days of alternating success and failure that the result is achieved.

The limits of physical and mental powers are reached in an engagement of several days' duration, ammunition is expended, and many

casualties occur. In the renewal and replacement of these, the *services de l'arrière* are taxed to their uttermost, and the prolonged battles of to-day depend for success, not only on the first line fighting troops, but on the efforts of the services in rear.

The duration of the battles of Liao-yang (8 days), Sha-Ho (5 days), Mukden (14 days), are unprecedented; and while it is due to the above-mentioned causes, it must not be forgotten that the stubborness of the Russian soldier, and lack of troops on the Japanese side, were additional reasons. If the enemy had not been superior in number to the Japanese, or, if instead of the Russians the Japanese had been opposed to the French Army, it is doubtful if the result would have taken so long to achieve.

The many days' duration of battles between large forces in the future, will require the elaboration of methods of supply, the conservation of strength and *moral* for the final phase, and the improvement of methods of ammunition supply.

7. Prevalence of Enveloping Attacks in the Exclusion of Assaults on the Centre, and the Necessity of a Fundamental Method of Deployment for Battle.

As mentioned above, modern firearms, and the use of entrenchments, have rendered positions so formidable as to make a frontal assault more and more hazardous. Experience shows that a frontal assault is likely to succeed only if one side is greatly inferior; or if the defender's front is unduly extended, or if there are gaps in the defence, or the attention of the latter is diverted, otherwise failure is to be expected.

Success is to be gained by flank or enveloping operations, but this does not necessarily imply that the assailant must be superior in numbers; on the contrary, it is not unusual for inferior numbers successfully to accomplish this. The battles of Liao-yang and Mukden are examples. The success of these battles, in which the Japanese were numerically inferior to the enemy, was due to a better and more economical distribution of troops (the occupation of main points, to the exclusion of unimportant ground), more skilful generalship, and superior *moral*. These enabled the numerically superior Russian Army to be enveloped and defeated.

As previously mentioned, the number of men per pace at the battles of Liao-yang, Sha-Ho, and Mukden, were: Russians, from $2\frac{1}{4}$ to $3\frac{3}{4}$; Japanese, only from $1\frac{1}{4}$ to $2\frac{1}{4}$. This difference was undoubtedly due to the better quality of the troops, and the more skilful generalship on the Japanese side. At the battle of the Sha-Ho, the main force of the Russians, advancing south through the mountains, was held in check by a portion of the Japanese Army, while the main portion of the latter attacked with the intention of surrounding the portion of the Russian Army, advancing in the plains. The Japanese won the battle, but the forces engaged were very unequal in strength; and the Russians, moreover, recalled their main forces to the plains during their retreat; so that, finally, the main fronts of both sides were opposed, and envelopment could not be effected. As a consequence, the action could not be brought to a conclusion, and for a long time both sides faced each other at short range.

This is one of the cases where superior leadership and *moral* cannot, with altogether disproportionate numbers, effect an envelopment.

Flanking, or enveloping attack, giving the best chances of success to-day, it is of importance to lay down the distribution for the deployment of the troops at the commencement of a big engagement, in order that the troops should be so placed that, from the first, deployment can be made on a wide front, with strong reserves on both flanks, and especially on the flank to be attacked. If, on the contrary, this distribution is delayed until after the commencement of an action, and mass formations preserved, during the considerable time occupied by a deployment, the force is liable to be surrounded, or diverted from its purpose by the enemy. The standing principle, that at the commencement of an action the enemy must be reconnoitred, and after the situation has been gauged, the plan of action decided on must not be lost sight of; but it applies rather to an action between small forces, or to one part of the field. It is inapplicable to a large engagement as a whole, though reliable information of the enemy, and just appreciation of the ground, is still required.

The conduct of the Russian Army at the battle of Mukden is an apt illustration of this necessity of deciding, before the commencement of an action, the deploying front and the flank for the decisive action, and it shows the disadvantageous moving about of troops, and envelopment at the hands of the enemy entailed if it is neglected.

Moltke said that "the strategic distribution of the forces (or strategic deployment) at the commencement of a campaign was the foundation of subsequent success." The determination of the mode of employment of an army at the outset of a big engagement is closely parallel, and is likewise the foundation of victory. The similarity is the natural result of the massing of immense numbers on one battlefield, and, just as strategic envelopment gives a definite advantage, so an enveloping or flank attack is the fundamental disposition for a big engagement commencing at long range.

8. Increase of the Occasions when Reconnaissance is Made in Force.

Formerly, before firearms had reached their present development, the movements of the massed bodies of the enemy were disclosed at a glance, and their object revealed. Reconnaissance and scouting were, therefore, easier than now, when the precision and power of modern firearms, and especially the introduction of smokeless powder, make observation with the naked eye, or with glasses, a matter of difficulty. In addition, the general use of open formations and of cover makes detection difficult; while smokeless powder enables the enemy to open fire on our scouts without exposing his position; the protective screen thrown out in front of the main force also adds to the difficulties of reconnaissance.

The necessity therefore arises, for an increase of strength in scouts, or reconnoitring bodies, in order to thrust aside the enemy's covering force, and expose the situation in rear. In return, the enemy tends to increase his covering force, so that we find that in the late war, reconnaissances in force were frequently made by bodies of all arms, especially in the latter stages, as at Feng-hua and Chang-tu.

Here, while the two armies were facing each other, each posted covering detachments in front of the main position, and also continually sent out reconnoitring forces to attack the enemy's covering detachments. Thus the reconnaissance action was of frequent occurrence, and not before it was repeated several times was it possible to gain a rough estimate of the enemy's main position.

Covering detachments thus resemble advanced posts, with the proviso that advanced posts should offer as prolonged resistance as possible to a main attack. On the other hand, the object of covering detachments is only to oppose the operations of the enemy's reconnoitring force, so soon as it realises that a main attack is intended, it had no other course than to fall back. But, owing to the nature of modern fighting, it is a matter of difficulty to determine at once whether the enemy intends a main attack, or a reconnaissance action. Consequently, there is a fear that a covering force, in the same way as an advanced post may be unwittingly committed to a main action. But the advantages that modern weapons give to the defence, enabling a comparatively small number of men to cause a large force of the enemy to deploy and to hold it in check, have decreased the danger of committal to a main engagement.

This prevailing habit of putting out covering detachments and advanced posts requires the conduct of a reconnaissance in force, in order to clear them away and to expose the situation behind them. This display of force is never intended to be employed against the enemy's main position, but it is difficult at the outset to distinguish the main position from a covering position, and it is quite possible to penetrate unconsciously into the main position.

Close approach to the enemy in these days of long ranges is not only a matter of great difficulty, but, when it has been accomplished it is extremely difficult to observe the action, therefore it is unconsciously carried on and carried on, until at length its suspension is difficult, and heavy losses are incurred. It becomes, therefore, of great importance, in operations in force, to distinguish between the main position and advanced positions. To discover this, scouts will be employed to search every point in the enemy's front, and the fact whether the enemy's dispositions are continuous or not, is practically the only method of revealing the truth. If the reconnaissance in force of a main position is not converted into a main attack, it degenerates into an attack of a half-hearted or partial nature, as illustrated by the method of attack of the 2nd Russian Army at Hei-kou-tai. This was partly a reconnaissance in force, and partly an attack, and the Russians, instead of converting it into a main attack with their whole force, held back. The result was, that after a large and useless sacrifice of men, they retired to their original position.

From what has been stated before, we see that while the disadvantages from which advanced posts suffered when opposed to an enemy's main attack have decreased, such advanced posts cause greatly increased difficulties in the reconnaissance in force of an enemy's main position. This is due to the advantage that modern firearms have given the defence, as against the attack.

As, owing to its difficulties, reconnaissance must now be backed up by force, cavalry employed in this duty can no longer simply depend on its speed and power of vision. It requires backing up by a volume of fire, and it is now an axiom that it must be accompanied by

machine guns or horse artillery. Cavalry with these additions is able to reconnoitre an enemy at a distance, or hold a distant enemy in check, or, when the opposing forces are close together, to be entirely responsible for the protection and reconnaissance of the flanks; or to undertake raids on the enemy's line of communications. But when both armies are in contact, the reconnaissance of the front cannot be relegated to the cavalry, it must be carried out by a force of all arms.

Although the battles between large forces of the present day may not necessitate the study of minor tactics, yet for the purposes of reconnaissance it has become increasingly necessary.

Needless to say, spies are a valuable adjunct to the service of reconnaissance. The nature of the native population chiefly affects this question; but, unless a prolonged stay is made in one spot, spies will rarely be used. Also, on account of the unreliability of spies, they will be used in combination with other methods of reconnaissance (as single scouts or small patrols). All means of gaining information of the enemy should be employed, and it should be borne in mind that the reconnaissance in force is only resorted to when other means have failed.

9. Decrease in the Distinctive Character of Fortress, as Opposed to Field Warfare.

The use of entrenched positions and field fortifications is one of the chief features of modern field warfare. The contention that the admixture of methods of position warfare with mobile operations is a useless check to the execution of the latter, is irrelevant. It goes without saying that the main objective is the enemy's field army, and that his fortresses will be neglected.

However, in the Far East, where communications are imperfect, and a network of railways not yet spread, the operations of a big force are governed largely by considerations of supply. The so-called "mobile" operations are not conducted with the mobility that the name suggests; a large force is unable to move far away from the railway, and large turning movements, avoiding the enemy's fortified posts on the railway line, and striking at his interior, are operations of extreme difficulty. In the large plains of Europe, crossed by railways in every direction, the question is different, but free movement is as yet impracticable in the Far East.

Consequently, methods of position warfare are unavoidably intermingled with field operations—heavy or siege artillery, and much expenditure of time are required to reduce the enemy's entrenched positions, and with the increase in the numbers brought into the field, these features will become more pronounced.

In the Far East, not only will there be regular fortresses to be besieged, but in field operations positions of the nature of fortresses will be frequently encountered. It is, therefore, necessary for divisions of the field army to be exercised in peace in operations connected with fortress warfare, and that study of fortress tactics should go hand in hand with that of field operations.

10. Increase of the Use of Night for Operations.

Formerly, night operations were usually conducted on a small scale, and with a small number of men, but in recent warfare, in

order to avoid the effect of the enemy's fire, or to conclude an action on one day, or to deploy and to make all preparations to enable fighting to be commenced with daylight, darkness has frequently been made use of.

In the late war regular night actions, hitherto considered so difficult of accomplishment, were frequent occurrences, although the occasions when large forces, as a division or more, were used were rare. In fortress operations also, night operations were more frequent than formerly.

The power of modern weapons has greatly increased the difficulties of the close approach of the attacker in daylight, as compared with night. It goes without saying, that it is easier to reduce the difficulties of night movements than the effect of firearms in the day. Moreover, mechanical improvements, as portable lamps, dark lanterns, and searchlights, have, to a certain extent, facilitated the movements of troops at night. The constant improvement in the power of firearms, on the one side, and the march of science on the other, both tend to increase the use of night in the future.

Engagements are now not concluded in one day but stretch over several days, and consequently several nights. Attacks which failed in daylight, will be repeated at night; order will be restored; ammunition will be renewed; preparations will be made for the fight the next day; or, if separated from the enemy, contact will be again resumed; or arrangements will be made for pursuit. In short, night will be utilised to assist or complete the operations of the day, not merely, as formerly, as a period of rest, but a time when the most important work is done. Success will largely depend on the use, profitable or otherwise, of night.

Cases in the late war occurred when a division was used in a night action; but the whole division was not deployed, nor came into hand-to-hand conflict with the enemy. The main body merely acted as a support to, and followed in rear of the first line.

In the present condition of science, the maximum that can be put in the first line, to actually oppose the enemy, is one regiment of infantry; that is, at one point.

In fortress or position operations, based on a fixed position, the necessity for artillery and engineers arises; that is, to hold a position against hostile attack at dawn, troops of all arms may be required in the first line.

A difficulty in connection with night attacks is, that after contact with the enemy has been gained, his retreat may not be noticed in time, and the opportunity for his pursuit lost. Night is the best moment for retreat, when the main body can be withdrawn to a distance, unknown to the enemy, and in order to be informed of a movement of this kind (since scouts are unable to pierce the enemy's outpost screen), reconnaissance at night, or, in other words, a species of night attack will be often necessary.

The chief weapon for night action remains, as before, cold steel; but if there is sufficient light to distinguish friend from foe, firing or hand grenades may be used. Also, the difficulties of carrying out night operations in pitch darkness are so great that unless there is a certain amount of light from the stars or moon, resort must be made to star shells or searchlights.

The need for training and skill in the use of the bayonet, and, still more important, the cultivation of individual courage, is evident.

Improvements in night glasses, rendering it possible to distinguish objects at night, may work a revolution in night operations. Further, the use of searchlights, or observation from balloons, facilitate the use of night for operations.

Since the difficulties of night operations are largely due to ground, and especially to obstacles, accurate reconnaissance of the ground in daylight is all important. And, since detailed reconnaissance is generally only practicable when both sides have been opposite each other at close range for some time, night will be used to bring an engagement to a conclusion, or, in fortress warfare, and not to deal an unexpected blow at a distance. Night actions were comparatively common in the late war, and also the occasions when both sides occupied positions facing each other at close range for several days were numerous. The tendency is for these conditions to increase, and with the improvements in science, and increase in the power and precision of the firearm, night will be more than ever used for operations in the future.

Conclusion.

The contents of the above ten headings are almost entirely based on the teachings of the Russo-Japanese War. The discussion does not enter upon difficult questions not yet solved, nor does it raise anything new, and in dealing with questions already generally discussed, it is not intended to be more than an aid to the understanding of the main features of modern operations in war.

Questions dealing with education or organisation fall outside the scope of this article; but it is, perhaps, permissible, in conclusion, to add a few words for purposes of reference.

Military questions must be looked at from two points of view: the material aspect, constantly changing with the development of mechanical science; and, secondly, the moral aspect, which remains constant.

To sum up, the points that require attention are as follows:—

1. Military requirements are now so varied that army training must confine itself to essential matters only. For instance, infantry must be thoroughly instructed in skirmishing, fighting methods, scouting duties, night operations, bayonet exercises, field works, and fighting in trenches; while close order drill, dressing, and exercises in complicated formations may be more or less neglected.

2. When the chief desideratum was volume of fire, numbers rather than training and discipline were desired. But the late war has shown us in its frequent night actions and bayonet engagements that, rather than numbers, the need for highly trained and disciplined troops is paramount. Moreover, the use of natural features in skirmishing and firing, scouting, and reconnaissance duties have made increased demands on the intelligence, decision, and initiative of the rank and file. The introduction of the two years' system makes the proper cultivation of these qualities a matter of serious moment.

3. A high moral (or spiritual) standard, or, in other words, the possession of loyalty and patriotism, is of absolute importance in war. Further, the qualities of endurance, thoroughness, quickness, and courage must be cultivated, and especially, in view of the difficulties and stress of the modern battle, a "spirit of attack" is of the first

necessity. The endeavour of peace training should be to cultivate this quality to a high degree.

4. The progress of science has added to the rôles of the various arms. We now find: infantry, machine gun detachments, cavalry, mounted machine gun detachments, field (including mountain) artillery, heavy artillery, horse artillery, engineers, telegraph sections, railway sections, balloon sections, and transport troops. In future, engineers may be divided into field and fortress sections, or divided into mounted or dismounted branches. Mounted infantry, or mechanical transport sections may appear, or we may see the additions of mounted telegraph or wireless telegraph sections, or telephone or searchlight detachments, or mechanical transport trains.

Multiplicity of divisions increase the difficulties of command, and this tendency, therefore, should be guarded against, as far as possible.

5. Battle training is usually confined to the action of one part of a large force, but training in co-operation is also a necessity. Reconnaissance, use of cover, and night operations should be practised by an independent detachment, and unit commanders, and especially subordinate leaders, should be trained to acquire the habit of initiative and decision.

THE BATTLE OFF TSU-SHIMA.

IN MEMORY OF "THE SUVÓROFF."

A PERPETUAL TRIBUTE TO FALLEN HEROES.

Translated from the Russian of Commander Vladimir Semenoff, Imperial Russian Navy,

[With the Author's permission],

By Lieut.-Colonel W. E. GOWAN, Retired List, Indian Army.

Continued from June JOURNAL, p. 706.

I have already mentioned that, in the event of the "Suvóroff" having to withdraw from the battle line, the torpedo-boats "Baidóvoii" and "Bwistrii" were to steam up so as to convey the Admiral and his Staff to another and less crippled vessel. Meanwhile, in order to avoid confusion, until the Admiral's Flag had been transferred, or until the signal had been hoisted, notifying the transfer of the supreme command, the Squadron was to follow that vessel immediately astern of the van leader that had fallen out of the battle-line.

I will not take upon myself to here decide the following questions:—"Was it possible to see from the other vessels that no torpedo-boats had approached the 'Suvóroff'? Was it evident to everyone that from a battered and burning battle-ship, without masts and without funnels, any kind of signal might be looked for in vain? Would it, therefore, have followed *ipso facto* that the supreme command had already been transferred to the officer next in rank, and that he should, in some way or other, have proclaimed his assumption of authority?" In any case, the "Alexander," or, to speak more correctly, her commander, Captain of the First Rank Bukhvostoff, did in effect carry out the pre-arranged order and perform the delegated duty. For after the withdrawal of the "Suvóroff" from the battle-line, he, without waiting to receive fresh instructions from any one, continued to engage his ship, and, as his vessel was the one immediately behind the withdrawn van-leader, she became the leader of the Squadron.

From the moment that I saw her passing the "Suvóroff," on a S.E. course, the "Alexander" maintained that course for twenty minutes, and then gradually inclined in a southerly direction, thereby endeavouring to prevent the enemy making any considerable advance ahead, or from moving right across the changed course of our Squadron. It was at this time, too, that the Japanese, elated by their first success, were again endeavouring to carry out their idea—that of attacking with all their force our van-leader for the time being. Indeed, so intent were they in their efforts that they opened to the "Alexander" a course heading N.E. which brought her astern of them. Her cap-

tain then improved upon this by sharply turning N., reckoning thereby that if this change of position were successful he might bring all his fire to bear upon their sternmost vessels, and take them with a raking fire. Japanese despatches vary in determining the precise moment of this change of course of our Squadron; some give it as 2.40 p.m., others 2.50 p.m.[1]

According to my personal observation, the time last quoted is the more probable.

If the enemy's Fleet had begun to turn "in succession," as it had done at the beginning of the battle, then the manœuvre of the "Alexander" might have been successful; but, recognising the gravity of the moment, Togo this time decided upon directing his vessels to turn "together" 16 points[2] to port. This manœuvre was not, however, altogether successful. The First Division, consisting of the "Mikasa," "Shikishima," "Fuji," "Asaki," "Kasuga," and "Nishin," carried it out, as it ought to have been done, but Kamimura's armoured cruisers, probably because they could not make out the signal or were expecting a turning movement "in succession," passed ahead of our Squadron on their old course, and thus lay on a course that was the very opposite of that of their battle-ships, thereby obstructing the line of their fire. After this it was only by steaming until they had got clear of them that they could find room to turn once more "in succession," and then, after catching up their battle-ships, follow in their wake.

This was a moment of confusion, for which the Japanese might have had to pay dearly, but our Squadron was unable to take advantage of it, especially in the condition that it was in at this time.

The enemy, on the other hand, by taking advantage of his high rate of speed, not only succeeded in correcting the intervals in his extended line, but reached the goal at which he had been aiming, that of getting ahead of the course of the "Alexander," and again forcing her southwards.

From the starboard ports of our batteries we could now see the "Alexander" quite well as she bore almost on our beam, and was holding a course directly on us. Behind her were the rest of our vessels. As the distance lessened, our glasses distinctly showed her battered sides, her broken bridges, her blazing wreckage, but we also saw that her funnels and masts were still standing. Immediately behind her came the "Borodino," fiercely burning. The Japanese had already succeeded in overtaking them and in cutting across their course. Our own vessels were approaching us from the starboard, but those of the Japanese came out on our port beam.

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[1] I have omitted from the text of this translation the following passage inserted between brackets, which so appears in the Russian text ["the moment of the destruction of the 'Osliába,' which under the concentrated fire of the six armoured cruisers of Admiral Kamimura, had withdrawn from the battle line still earlier than the 'Suvóroff'"] because if the "Osliába" withdrew before the "Suvóroff," and if the "Suvóroff" was no longer in the battle-line, then neither of these vessels could have been in this change of course of the Russian Squadron.—W.E.G.

[2] Or 180°, *vide* note 1 on page 324 of JOURNAL for March, 1907.—W.E.G.

And whilst they fired at us and over us, our fore 12-inch turret (the only one that was undamaged at this time) took an active part in the new phase of the battle. To their falling shells we now paid no attention. Indeed, though I now received a wound in the left foot, I only looked down with some vexation at my torn boot. With bated breath, we all awaited results. It was evident that the whole force of the Japanese fire was being concentrated upon the "Alexander." At times she seemed to be completely enveloped in flames and brown smoke, whilst all around her the sea literally boiled, as gigantic columns of water were thrown up into the air. Nearer and nearer came the "Alexander" until at last her distance from us was not more than 10 cables' length.[1] But just then there came, one after the other, a whole group of hits, which were clearly seen to have struck her fore bridge and her port 6-inch turret. Thereon the "Alexander" immediately turned sharply to starboard, and falling back almost on a reverse course, steamed away.[2] And in her wake followed the "Borodino," "Orel," and the others. "They will speedily circle round, if not 'in succession,' then 'together,' even though they may not regain their line ahead formation," we thought.

A deep murmur ran through our battery.

"They have thrown away everything! They are sheering off! They have not made use of their opportunity!" were the fragmentary exclamations that resounded amongst our sailors.

They, poor simple folk, of course, thought that our Squadron, in returning towards the "Suvóroff," had done so with the object of extricating her from her helpless position. Their disillusion had been a painful one, but it was even more painful to him who understood the true importance of what had taken place.

Relentless memory, inexorable imagination, so clearly, so precisely recreated before my eyes, another, but similar, aye, and a like terrible picture: for in the same hasty, and in the same disorderly manner, our battle-ships had steamed away to the north-west on the 28th July (10th August), after the signal displayed by Prince Ohtomski.[3]

"Opportunity not made use of!" This terrible, this fatal phrase which I had not even dared to think of, much less to pronounce, incessantly clanged through my brain; nay, it seemed to be written in fiery letters upon the smoke of the conflagration, and upon the battered sides of the vessel, and upon the blanched and drawn faces of the crew.

Bogdanoff was standing by my side. We had exchanged glances, and, it seems, we had read each other's thoughts. He seemed to wish to say something, but suddenly stopped in the very effort, then, after taking a look round, he broke silence by saying, in a would-be collected tone of voice:—

"It seems to me that we have a very marked list to port!"

"Yes," said I in agreement, "it will be about eight degrees," and pulling out my watch and my note book, I jotted down: "*Time*

[1] About one and one-seventh miles.—W.E.G.

[2] Whether this change in her course was intentional or accidental, *i.e.*, whether it was the result of some damage done to her steering gear, will always remain a secret.—*Author.*

[3] This signal directed the Russian vessels to withdraw from the fight and make for Port Arthur.—W.E.G.

3.25 p.m.; a strong list to port; in the upper battery a huge conflagration."

Then I more than once reflected: "What is it that we have hidden from ourselves, and from each other? Why had not Bogdánoff at once made up his mind to speak out his thoughts, and why had I not dared to write, even in my own note book, this disquieting, this dread word—*defeat*? It may be that there still flickered within us some sort of confused hope that a miracle might take place, that something of the unexpected might occur, whereby everything would be changed? I know not.

After the last turn of the "Alexander," the Japanese vessels also turned "together" 16 points.[1] This time their manœuvre was successfully performed. Indeed, it seemed that in their case it was no longer a battle, but only a display of naval tactics.

Reverting to their original course, the Japanese vessels passed under our bows, and so close to us that it looked as though the "Suvóroff" would be run down by them. They then turned to starboard in the wake of our Squadron. Of course, it was nothing more than self-deception on our part imagining that our engines had been repaired, for judging not by surrounding objects but by the compass that had been removed from the "fighting post," we were making no way at all, but merely heading now to starboard, now to port, yet all the time remaining almost stationary.

As he passed us, it can be understood that the enemy could not forego the opportunity of concentrating his fire on the obstinate vessel, which had shown no desire to sink. Now it seems that at this time our last turret—the fore 12-inch—had been put out of action.

According to Japanese accounts, at the moment that their larger vessels were passing us, their torpedo-boats attacked us, though not successfully. All I can say is that I did not see them.

One of their shells, however, struck the port-hole so successfully of the 75 mm. gun, that was fourth from the bow in our lower port battery, that after upsetting the gun, it penetrated the armour-plated deck. The water that surged up, in consequence of our list to port, against this smashed port hole, did not flow back, but found its way through the rent thus made on to the berth deck, and this, of course, constituted a serious danger. Bogdánoff was the first to draw attention to it, and we began to construct out of bags (or whatever else came to hand) some sort of breastwork, so as to secure the rent from any further inflow of water. I say "we" did this because at this time the attenuated band of men now remaining in the battery did not respond to any orders. These men merely huddled together in a sort of dazed condition in corners. We had to draw them out, not by force, but by the display of example, viz., by doing the work with our own hands. We were joined in it by Flag-Torpedo-Lieutenant Leontieff, who came from some other part of the vessel, and by Demchinski. Only a strong sense of duty could have induced the latter to try and help us, for he had both his wrists bound round with bandages.

At 3.40 p.m. there resounded through the battery, and then throughout the battle-ship, a triumphant "Hurrah!" Whence and

[1] See note 1. on page 324 of JOURNAL for March, 1907.—W.E.G.

from whom the shout originated, and of what he was dreaming, remained a mystery. It was given out, as though someone had witnessed it, that a Japanese vessel had foundered. Others even asserted that not one but two had gone to the bottom! In any case, this shout of triumph suddenly and sharply changed the demeanour of the crew; and it shook off the depression called forth by the spectacle of the pounding of the "Alexander," and the sheering off of our Sqaudron. Men, who had but recently been huddling in corners, deaf to the orders and even to the entreaties of their officers, now of their own accord ran up to them with questions such as these: "Where shall I go? What shall I do?" One even caught the sound of jocular exclamations, such as, "Come on! Cheer up! Courage! These are 6-inch shells, the 'Chemodáni'[1] are all used up!"

And certainly, as the vessels of the Japanese main body increased their distance from us, we came only under fire of the light cruisers of Admiral Dewa, and the shells from these, in comparison with what we had already experienced, were almost imperceptible as to results.

The Captain V. V. Ignatius, who, after the biniding up of his second wound in the head, had remained in the sick bay, could, of course, no longer restrain himself at such a moment. So, in spite of the protests of the Surgeon, he rushed up the ladder leading to the battery, shouting as he went:

"After me, men! To the fire! to the fire! If only we could put out the fire!"

After him sped various non-combatants, whose duties lay in the sick bay, such as sanitary orderlies, and some slightly-wounded men, whose injuries had been attended to.

At this moment a random shot struck the hatchway, and as soon as the smoke from the explosion had cleared away, there was no ladder, no captain, and not one of those who had stood around him—no, not a living soul.

Still, even this bloody episode (one of hundreds of others) did not damp the revived spirit of the crew. In the lower battery, where, on account of the deficiency of hands, the conflagrations had begun to require ever increasing attention, men appeared and clamoured for work to do. Of the ship's officers, besides Bogdánoff, I may mention amongst others who then came, Lieutenant Viruboff, Junior Torpedo-Officer, a young, well set-up, healthy man. Clad in an unbuttoned linen coat, he everywhere threw himself with a will into the thick of it, and one of his shouts, "Pull away! don't give in!" that resounded amidst the smoke and flames, seemed to redouble the strength of the workers. Then there soon came up Zotoff, who had been wounded in the left side and arm; and out of the sick bay peered Prince Tsereteli, asking how the work of putting out the fire was progressing. Soon after this they brought along Kozákevitch, who had been badly wounded a second time. And then my orderly, Matrósoff, turned up from somewhere, and he began, though he could hardly stand upright, to drag me almost by force to the dressing-station. I could only get rid of him by directing him to first of all bring me some cigarettes out of my cabin. Bravely shouting: "There are some, your Excellency!" he went off, and we never saw each other again.

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[1]For a description of this class of projectile reference should be made to the Author's note on page 467 of JOURNAL for April, 1907.—W.E.G.

(To be continued.)

NAVAL NOTES.

Home

The following are the principal appointments which have been made:—Captains—W. de Salis, M.V.O., to be Captain of Chatham Dockyard; R. G. O. Tupper, to "Excellent"; M. E. F. Kerr, M.S.O., to "Implacable"; H. L. Tottenham, to be Captain of Portsmouth Dockyard; C. J. Eyres, to "Jupiter"; F. G. Eyre, to "Mars"; the Hon. G. A. Hardinge, to "Spartiate"; E. H. Grafton, to "Good Hope"; S. St. J. Farquhar, to "Doris"; J. C. Ley, to "Endymion"; W. Lumsden, to "Gladiator"; R. Nugent, to "Flora"; H. W. Savory, M.V.O., to "Prince of Wales"; W. B. Fawckner, to "Venerable."

The first-class cruiser "Crescent," which is taking out relief crews for the second-class cruiser "Flora," on the China station, and for the third-class cruiser "Pyramus," on the Australian station, left Plymouth on the 11th inst. for her destination. The second-class cruiser "Forte" paid off on the 7th ult. at Chatham, from the Cape station.

Launches.—The new first-class armoured cruiser "Inflexible" was launched on the 26th ult. from the yard of Messrs. John Brown and Co., Clyde-bank, and is the last to be put into the water of the three vessels of similar design ordered by the Admiralty. All three ships are identical in their features, and their auxiliary machinery has been made to be interchangeable. The turbines are alike in their general dimensions, so that they may be transferred from one vessel to another. Like her sister ships, the "Inflexible" will have great fighting power and high speed. As in the case of the others, the details of her design have not been officially disclosed. The principal dimensions and features are, however, available. She has a length over all of 530ft., a beam of 78ft. 6in., with a draught of 26ft. The weight of the hull is given as 9,660 tons, and the displacement 17,250 tons. In propelling force she is exceptionally powerful, as the engines are to develop 41,000 I.H.P. The speed to be attained is 21 knots, the coal capacity at load draught being 1,000 tons. The machinery is of the Parsons steam turbine type, steam being supplied from water-tube boilers. There will be four shafts. On each of the two inner shafts there will be a cruising turbine—low pressure ahead and low pressure astern — while on each of the outer shafts will be a high pressure ahead and a high pressure astern turbine. The "Inflexible's" armament will consist of eight 12in. guns, equal to 381,576 foot-tons for one round. All the guns can be fired on either broadside. The bow guns are on the centre line forward, while on the same high level there is amidships, on each broadside, a pair of guns in barbettes, which are not in the same athwartship line. The barbette on the port side is sufficiently further forward than that on the starboard side to enable all four amidship guns to fire on either side. The "Inflexible" has a complete belt of armour from bow to stern, the maximum thickness being 7in., tapering to 4in. at each end. The guns will

Home. be within 7in. barbettes, and have large armour hoods. The cruiser will also have machine guns for defence against torpedo attack.

The "Tartar," one of the new ocean-going torpedo-boat destroyers ordered from Messrs. John I. Thornycroft and Co. (Limited), was launched on the 27th ult. from the company's Southampton works. The dimensions of the vessel are:—Length, 270ft.; beam, 26ft.; draught, 8ft. 2in. The contract speed is 33 knots. The vessel is to be fitted with turbine machinery of the Parson's type (built by Messrs. Thornycroft) and six Thornycroft water-tube boilers, arranged for burning oil fuel. The armament will consist of three 12-pounder quick-firing guns and two 18in. torpedo-tubes.

Loss of Torpedo-boat No. 99.—On the 19th ult. Torpedo-boat No 99, owing to an accident during a steam trial, sank off Berry Head. Accompanied by torpedo-boats Nos. 107, 81, and 105, belonging to the Devonport flotilla, No. 99 left Plymouth early on the morning of the 19th ult., and proceeded eastward for a quarterly steam trial. The weather was favourable for the steaming test of craft of this description, and in getting into the Channel the senior officer of the division ordered the engines to be worked up for the trial. The vessels were about five miles off Berry Head, and were steaming at a good rate, when the stern shaft of the engine of No. 99 snapped, and she at once began to sink. The torpedo-gunboat "Dryad," which was on her way from Plymouth to Portsmouth, observed a torpedo-boat flying signals of distress and low down at the stern and proceeded to her assistance. By that time only a small part of the bow was above water, and the work of rescuing the officers and men therefore demanded the utmost promptitude. The boats were quickly lowered, and the whole of the crew were got off the torpedo-boat just before she disappeared, the rescue being performed with coolness as well as promptitude. Torpedo-boat No. 99, which was built by Thornycroft, and was launched in 1901, was a 160ft. boat, with engines of about 2,800 h.p. Her trial speed was 25 knots. She carried a complement of 32 officers and men, and her commander was Sub-Lieutenant H. I. N. Lyon.

Admiralty Surveys.—The report on Admiralty surveys for the year 1906 by the hydrographers has been issued as a Parliamentary paper [Cd 3464]. The hydrographer, in his report of the work performed in the examination and charting of the seas and coasts in various parts of the globe, states that nine war vessels, two hired steam vessels, and a hired steam launch were employed for the purpose. The number of officers of all ranks employed in the several vessels amounted to 86, of whom 54 are surveying officers, and their crews to 777. The marine survey of India, which was, until recently, in charge of an officer of the Royal Naval Surveying Service, is now in charge of an officer of the Royal Indian Marine. During the year 1906 the rocks and shoals dangerous to navigation which were reported numbered 367. Of these 11 were discovered by ships striking upon them, 67 were reported by surveying ships, 14 by other British men-of-war, 28 by various British and foreign vessels, and 247 by colonial and foreign Governments. During the year a length of 658 miles of coast line has been charted, and an area of 2,950 square miles has been sounded over by British surveying vessels, but the need for more numerous and more detailed hydrographic surveys is manifest, particularly in those parts where commerce is spreading into localities which are but still imperfectly charted. During 1906 useful and important information has been received from the hydrographical departments of foreign Governments by the free interchange, in accordance

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with custom, of new charts and other documents bearing on hydrography; 260 new and 432 corrected editions of foreign Government charts and maps were received during the year. The Indian, colonial, and other authorities have also furnished much useful information. From officers of His Majesty's ships 58 charts, plans, and sketches of anchorages have been received for the amendment of official documents. During 1906 the new charts published amounted to 116, and 66 plates have been improved by the addition of 84 new plans; 86,868 charts have received corrections. Altogether the number of charts printed during the year has been 535,812. The notices to mariners issued has been 1,532. The books published by the department 24.—*Times*, etc.

France.

The following are the principal promotions and appointments which have been made: Vice-Admiral—H. A. Jauréguiberry to Command of the Squadron of the North. Capitaine de Vaisseau—P. J. Darrieus to "Couronne." Capitaines de Frégate—L. M. Ytier to "Vinh-Long"; E. A. Raffier-Dufour to "Shamrock"; M. J. Mourre to "Nive"; M F. Grasset to "Mytho"; M. J. Grandclément to "Elan."—*Journal Officiel de la République Francaise.*

Vice-Admiral Gigon, Commander-in-Chief of the Northern Squadron, has been obliged to resign his appointment from ill-health; on the 12th ult. he had to be landed from his flagship and sent to the Naval Hospital at Cherbourg, and was thus unable to take his part in the ceremonies attendant on the arrival of theirDanish Majesties at Brest, his place being taken by Rear-Admiral Philibert, his Second-in-Command. Vice-Admiral Jauréguiberry, who has been appointed to succeed him, is the youngest officer on the Vice-Admirals' list being still only in his fifty-eighth year. Vice-Admiral Gigon's flag was struck on board the "Léon-Gambetta" on the evening of the 19th ult., and that of his successor hoisted on the following morning. The new Commander-in-Chief is retaining the services of the senior members of his predecessor's staff, at least for the present.

The Explosion on board the "Iéna."—In view of the explosion on board the "Iéna" and the question of B powder, stringent regulations have been issued as to the complete separation of all black powder on board French ships in a separate magazine, which is on no account to be contiguous to the B powder magazine, the use of black powder will also be reduced as far as possible, it being only retained for salutes, fog signals, and impulse cartridges for discharging torpedos.

The accidents attributed solely to B powder, which, like other smokeless powders, does not burn explosively, have not had serious consequences such as those which took place in the "Amiral Duperré," "Descartes," "Vauban," "Charlemagne," and "Forbin," while the destruction caused in the magazine at Lagonbran and on board the "Iéna" must be attributed to the ignition of black powder.

Attention has been called by the Minister of Marine to the necessity of using every means to keep the B powder magazine as cool as possible, as this powder is undoubtedly very sensitive to the action of heat.

Return of Target Practice.—The return of target practice for 1906 or "Tir d'Honneur" has been published. With heavy and medium guns the battle-ship "Jauréguiberry" of the Northern Squadron, is placed first and then follow the "Carnot," "Iéna," and "Charlemagne."

Among the armoured cruisers the "Amiral-Aube," of the Northern Squadron, is first, and among smaller cruisers the "Desaix," of the Atlantic Squadron.

France. As regards light guns, in which all ships competed, the first two ships are the "Amiral-Tréhouart" and "Henri IV.," both of the Northern Squadron, and then follow in order of merit the "Suffren," "Gloire," and "Masséna." The Minister of Marine has distributed money prizes to a considerable amount among the guns' crews of the successful ships, and several of the gunnery officers have been placed on the list for the decoration of the Legion of Honour.

New Ships.—It has been now definitely decided that the new first-class battle-ship "Liberté" is to carry out her trials at Brest; the ship has been built at the Chantiers de la Loire, St. Nazaire, and great pressure was brought to bear on the Government to have her sent to Lorient for her trials, but all the arrangements having been made for her trials at Brest, the Minister of Marine was unable to make the desired change; it is doubtful, moreover, whether there is sufficient depth of water off this port to carry out the trials of such large ships successfully. The new first-class battle-ship "Démocratie" has completed her contractors' preliminary trials, and commissioned on the 5th inst. at Brest for her official speed trials, which will commence about the middle of this month. At the coal consumption preliminary trial at 10,500 I.H.P., to give a speed of 16 knots and a consumption of coal not exceeding 700 gr. (1·50 lbs.) per indicated horse-power per hour, the engines actually developed 11,000 I.H.P., giving a speed of 17 knots, with a consumption of 673 gr. (1·45 lbs.) per indicated horse-power per hour. During the official 24 hours' coal consumption run at 10,500 I.H.P., the consumpton for the first six hours is not to exceed 700 gr. (1·50 lbs.) per indicated horse power per hour, nor 750 gr. (1·62 lbs.) for the whole twenty-four hours' run.

The new first-class battle-ship "Patrie," at an additional trial before commissioning at Toulon, during a 48 hours' run with all boilers alight, with engines making 101 revolutions out of a possible 115, maintained an average speed of 17·5 knots. She left Toulon on the 1st inst. to join the fleet under the command of Vice-Admiral Touchard, certain defects in the ventilation of her auxiliary engine and dynamo-rooms, which had been reported by the Trial Commission, having been remedied.

The new first-class battle-ship "Justice" quitted La Seyne for Toulon on the 12th ult., and has commenced her contractors' preliminary trials, which have not as yet been very successful, various defects having developed.

The first keel plate of the new first-class battle-ship "Voltaire," of the Thomson programme of this year, was laid at the La Seyne yard on the 8th ult.; work is to be pushed forward energetically on her. The Minister of Marine has also given orders that the work of completing the remaining battle-ships of the 1900 programme are to be hastened so that all the ships may be out of hand by the beginning of next year.

The Naval Manœuvres.—The naval manœuvres, for which the Mediterranean and Northern Squadrons have been combined, are now being held, Vice-Admiral Touchard, the Commander-in-Chief of the Mediterranean Fleet being in supreme command. It was originally intended that the operations should extend over a period of fifteen days in the Atlantic, and for another fifteen in the Mediterranean, but the time has been somewhat curtailed. There has been no mobilisation of either ships or men for the manœuvres, as the elections for the Departmental Councils will prevent the reservists from being called out, but the ships of the 3rd Battle-ship Division of the Mediterranean, with the destroyer "Lahire," were brought up to their full sea-effective on the 25th June,

France.

the ships of the 4th Battle-ship Division, which will only take part during the last week of the manœuvres, remaining with their reduced complements. The Torpedo-boat Divisions of the 1st Line, and the Submarine flotillas, will, however, be temporarily mobilised and placed under the orders of the Commander-in-Chief.

The Northern Squadron, under the command of Vice-Admiral Jauréguiberry, consisting of the first-class armoured cruisers "Léon-Gambetta" (flag-ship of Commander-in-Chief), "Amiral-Gueydon," "Dupetit-Thouars," "Gloire," "Amiral-Aube," "Jeane d'Arc," with the unprotected cruiser "Forbin," as repeating ship, left Royan on the 1st inst., and after touching at the Isle d'Aix, proceeded towards the southern portion of the coast of Portugal. Off Lisbon the Squadron was joined by the "Cassini" and the destroyers "Bombarde," "Catapulte," "Flamberge," "Baliste," and "Bélier," between which port and the entrance to the Straits of Gibraltar the first phase of the manœuvres was to take place, a junction having to be effected between itself (B) and another friendly squadron (C) coming from the south, avoiding a conflict with an enemy's squadron (A). At the conclusion of the first phase of the manœuvres, the "Dupetit-Thouars" and "Amiral-Gueydon" will be temporarily attached to the light division of the Mediterranean under the command of Rear-Admiral Krantz.

The Mediterranean Squadron, on its side, rendezvoused on the 1st inst. at Mers-el-Kebir, being composed as follows:—

1st Division.
Battle-ships—"Suffren" (flag-ship of the Commander-in-Chief), "Charlemagne," "République."

2nd Division (Rear-Admiral Manceron, commanding).
Battle-ships—"Saint Louis" (flag-ship), "Carnot," "Gaulois."

3rd Division (Rear-Admiral Kiésel, commanding).
Battle-ships—"Masséna" (flag-ship), "Bouvet," "Jauréguiberry."

Light Division (Rear-Admiral Krantz, commanding).
Armoured cruisers—"Jules Ferry" (flag-ship), "Victor Hugo," "Condé," "Desaix."
To join later on—"Dupetit-Thouars," "Amiral-Gueydon."
Protected cruisers—"Du Chayla," "Galilée," and the destroyers "Lahire," "Dard," "Carabine," "Mousqueton," "Arbalete," "Sarbacane," and "Claymore."

After leaving Mers-el-Kebir, the fleet steered for the Straits of Gibraltar, passing through on the night of the 3rd—4th July, on which day the fleet was to divide into two groups, and the first phase of the manœuvres began.

Group A (Vice-Admiral Touchard).—"Suffren," "Charlemagne," "République," "Masséna," "Carnot," "Jauréguiberry"; Light Division—"Jules-Ferry," "Victor-Hugo," "Condé," and, after the junction, the "Dupetit-Thouars," and "Amiral-Gueydon."

Group C (Rear-Admiral Manceron).—"Saint-Louis," "Gaulois," "Patrie"; Light Division—"Desaix," "Du Chayla," "Galilée," "Lahire."

Group B (Vice-Admiral Jauréguiberry).—Consisting of the Northern Squadron and Group C, have to effect a junction with each

France.

other, both knowing that an enemy A stronger than either alone, but weaker than the two together, will try and prevent their junction.

Group C was to start from a point fixed on the parallel of Cape Mazagan, to the east of the 15th degree of longitude; Group A taking up its station between B and C, both of which knew the other's position on a certain day and hour, and if the junction was effected, the two combined squadrons were to seek A, and if possible bring him to action before the time fixed for the conclusion of this phase, viz., the evening of the 7th inst.

The maximum speeds were fixed: for Squadron A, 12 knots; for Squadron B, 15 knots; for Squadron C, 10 knots.

All the cruisers were considered of equal value.

B or C were to be considered as destroyed, if caught alone at a distance of under 4 miles from A. Every cruiser which remained an hour under fire within a distance of 3 miles from a superior force was to be considered captured.

Admiral Touchard had the undoubted advantage, that even if he failed to prevent a junction between B and C, his superior speed of 2 knots would enable him to avoid an action.

This phase of the manœuvres was thus to last only three days, instead of the thirteen or fourteen originally intended. On the 7th the whole fleet were to rendezvous at a point some ten miles to the west of Cape Spartel, when two days were to be spent in preliminary tactics in preparation for the practice of Admiral Fournier's system of tactics later on.

On the 9th the fleet was to temporarily break up, the 1st and 2nd Divisions of the Mediterranean Squadron proceeding to Algiers, the 3rd to Philippeville, the armoured cruiser division to Bizerta, and the Squadron of the North to Bône. Between the 11th and 15th the ships will coal and provision. Between the 15th and 17th, scouting for an enemy's squadron between Sardinia and the Balearic Islands will be carried out, and between the 17th and 20th, steam tactics.

The third phase of the manœuvres, which will last from the 21st to the 27th, will be the most interesting. The Committee on Tactics, presided over by Vice-Admiral Caillard, and the Superior Naval War School, under the command of Captain Amel, will embark on board the Mediterranean Squadron on the 21st July, in order to take part in the trial of the Fournier manœuvre system. For this period the fleet will be constituted as follows:—

1st Squadron (Vice-Admiral Touchard).
1st Division—"Suffren," "Charlemagne," "République."
2nd Division (Rear-Admiral Manceron)—"Saint-Louis," "Gaulois," "Patrie."

2nd Squadron (Vice-Admiral Jauréguiberry.
1st Division—"Léon-Gambetta," "Amiral-Aube," "Dupetit-Thouars."
2nd Division (Rear-Admiral Philibert) — "Gloire, "Amiral-Gueydon," "Jeanne d'Arc."

3rd Squadron (Rear-Admiral Germinet).
1st Division—"Brennus," "Charles Martel," "Hoche."
2nd Division (Rear-Admiral Kiésel)—"Masséna," "Jauréguiberry." "Carnot."

Light Squadron (Rear-Admiral Krantz).
1st Division—"Jules-Ferry," "Condé," "Victor-Hugo."
2nd Division—"Desaix," "Du Chayla," "Galilée," "Cassini."

France.

The enemy will be represented by the 2nd Light Division (Captain Moreau, senior officer) and the destroyers.

The manœuvres will come to an end on the 31st July. Target practice will be carried out on the 29th and 30th; as well as combined exercises with the submarine and *défense-mobile* of Toulon—*Le Yacht, La Vie Maritime, Le Moniteur de la Flotte* and *Le Temps.*

Germany.

GERMANY.—*The Estimates for 1907.*—The Estimates for 1907 amount to 278,528,891 marks (£13,926,444 11s.), as against 253,456,685 marks (£12,672,384 5s.) voted for 1906, showing an increase of 25,072,206 marks (£1,253,610 6s.). The following are the principal items:—

ORDINARY PERMANENT ESTIMATES.

	Proposed for 1907.			Voted, 1906.	
	Marks.	£	s.	£	s.
Imperial Ministry of Marine and Naval Cabinet	1,898,540	= (94,927	0)	89,660	10
Naval Headquarter Staff	309,335	(15,466	15)	16,603	0
Observatories, etc.	366,534	(18,326	14)	17,819	4
Station Accounts Department	617,958	(30,897	18)	28,945	0
Legal Department	170,320	(8,516	0)	8,410	0
Chaplains' Department and Garrison Schools	139,815	(6,990	15)	6,753	16
Pay of Officers and Men	29,030,675	(1,451,533	15)	1,350,904	12
Maintenance of Fleet in Commission	31,197,160	(1,559,858	0)	1,431,523	0
Allowances for Officers and Men	2,176,374	(108,818	14)	103,265	4
Clothing	440,283	(22,014	3)	20,617	18
Barrack and Garrison Administration, etc. ...	962,390	(48,119	10)	74,662	15
Barrack and Garrison Construction	669,334	(33,466	14)	—	
Lodging Allowance	2,557,057	(127,852	17)	119,518	0
Medical Department	2,317,738	(115,886	18)	105,592	17
Travelling, Transport, and Freight Charges ...	3,411,000	(170,550	0)	172,300	0
Training Establishments	492,557	(24,627	17)	20,249	17
Maintenance of Fleet and Dockyards ...	29,578,470	(1,478,923	10)	1,403,135	14
Ordnance, Arms, and Fortification	11,193,698	(559,684	18)	515,942	8
Accountant-General's Department	920,667	(46,033	7)	43,664	10
Pilotage and Surveying	730,980	(36,549	0)	35,464	16
Miscellaneous Expenses	1,561,381	(18,069	1)	74,944	5
Administration of Kiau-Chau Protectorate ...	103,915	(5,195	15)	5,107	7
Total	120,846,181	(6,042,309	1)	5,645,114	3

SPECIAL ORDINARY ESTIMATES.

Shipbuilding Programme for 1907.

For the construction of the following ships:—

	Marks.	£	s.
The first-class battle-ship "Pommern" (*O*), 4th and final Vote	2,350,000	= (117,500	0)
" " " "Hannover" (*P*), 4th and final Vote	2,350,000	(117,500	0)
" " " "Q," 3rd Vote	4,650,000	(232,500	0)
" " " "Schlefien (*R*)," 3rd Vote ...	4,650,000	(232,500	0)
" " " Ersatz "Bayern" 2nd Vote ...	8,600,000	(430,000	0)
" " " Ersatz "Sachsen" 2nd Vote ...	8,600,000	(430,000	0)
The first-class armoured cruiser "Gneisenau (C), 4th and final Vote	1,500,000	(75,000	0)
" " " "Scharnhorst" 3rd Vote...	4,270,000	(213,500	0)
" " " "E," 2nd Vote	6,000,000	(300,000	0)

Germany.

	Marks.	£	s.
For the construction of :—			
The third-class cruiser "Stuttgart" (*O*), 3rd and final Vote	1,090,000	(54,500	0)
" " " Ersatz "Wacht" 3rd and final Vote	1,090,000	(54,500	0)
" " " "Nurnberg," 3rd and final Vote ...	1,090,000	(54,500	0)
" " " Ersatz "Pfeil," 2nd Vote	2,430,000	(121,500	0)
" " " Ersatz "Comet," 2nd Vote	2,430,000	(121,500	0)
Mine-ship B, 2nd and last Vote	1,000,000	(50,000	0)
A Flotilla of Torpedo-boats, 2nd and last Vote	6,400,000	(320,000	0)
One Flotilla of Torpedo-boats, 1st Vote	8,000,000	(400,000	0)
Tender Ersatz "Ulan"	500,000	(25,000	0)
Battle-ship Ersatz "Wurttemberg," 1st Vote	3,000,000	(150,000	0)
" Ersatz "Baden," 1st Vote...	3,000,000	(150,000	0)
First-class Cruiser "F," 1st Vote	3,000,000	(150,000	0)
Third-class Cruiser Ersatz "Greif"	1,500,000	(75,000	0)
" " Ersatz "Jago"	1,500,000	(75,000	0)
Fitting up battle-ship "König Wilhelm" as a Volunteer Drill ship, 1st Vote	400,000	(20,000	0)
Construction of Sailing Yacht Ersatz "Wille"	30,000	(1,500	0)
Repairs and alterations to first-class battle-ship "Hansa," 1st Vote	750,000	(37,500	0)
Improvements to the first-class armoured cruisers "Hertha" and "Victoria Louise," 2nd and last Vote	2,500,000	(125,000	0)
Construction of and experiments with Submarines... ...	3,000,000	(150,000	0)
Total	85,880,000	(4,294,000	0)
For the Gun and Torpedo Armaments of New Ships, and Mines...	42,590,000	(2,129,500	0)
Miscellaneous Expenditure: Dockyards, etc.	7,038,150	(351,907	10)
	136,392,450	(6,819,622	10)
From which has to be deducted, credited in the Extraordinary Estimates	36,080,000	(1,804,000	0)
Leaving Total	100,312,450	(5,015,622	10)

Summary.

	1907. Marks.	£	s.	1906. £	s.	Increase, 1907. £	s.
Ordinary Permanent Estimates	120,846,181	(6,042,309	1)	5,640,101	15	(402,207	6)
Shipbuilding, Armament, etc.	100,312,450	(5,015,622	10)	4,434,482	10	(581,140	0)
Extraordinary Expenditure ...	57,370,260	(2,368,513	0)	2,598,250	0	(270,263	0)
Total	278,528,891	(13,926,444	11)	12,672,834	5	(1,253,610	6)

—*Etat für die Verwaltung der Kaiserlichen Marine auf das Rechnungsjahr, 1907.*

United States.

Launch of the first-class armoured cruiser "North Carolina."—Want of space has prevented our earlier giving details of this new cruiser, which was launched on 6th October, last year, at Newport News. Her dimensions are as follows:—Length on L.W.L., 502 feet; length over all, 504 feet 5½ inches; breadth extreme, 72 feet 10½ inches; depth amidships, moulded, 42 feet 2¾ inches; draught, full load (mean), 27 feet ¼ inch; displacement, fully loaded, 15,980·86 tons; displacement on trial, 14,500 tons; draught on trial, 25 feet; total coal capacity, 2,000 tons; coal on trial, 900 tons; maximum

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speed, average of four hours' run, 22 knots; maximum I.H.P., main engines, estimated 25,000.

Armament: Main battery, four 10-inch breechloading rifles; sixteen 6-inch breechloading rifles; four 21-inch submerged torpedo-tubes. Secondary battery, twenty-two 3-inch rapid-fire guns; twelve 3-pounder semi-automatic rapid-fire guns; two 30-calibre automatic guns; two 3-inch field guns.

The hull is of steel throughout, and protected by a water-line belt of armour worked in vertical strakes amidships, where it is about seventeen feet three inches in height, extending from the protective deck to the gun deck port sills, being stepped down at the ends; of a uniform thickness of five inches throughout the machinery and magazine space and three inches forward and abaft this.

The upper side armour will be disposed in wake of the 6-inch battery, and will be five inches thick throughout. Nickel steel two inches thick will be disposed in wake of the 3-inch battery. Athwartship armour of 6-inch uniform thickness will be fitted from the protective to the main deck. The 10-inch barbettes will extend from the protective deck to about five feet above the main deck, and will consist of 8-inch armour in front and 4-inch at the rear below, and 6-inch armour above the gun deck. The 10-inch turrets will have a front plate nine inches thick, rear plate five inches thick, sides plates seven inches thick, and top plates two and a half inches thick. The conning-tower will be nine inches thick, and will have a door five inches thick. Signal tower to be five inches thick. An armoured tube, thirty-six inches in diameter, will extend from the base of the conning-tower to the protective deck, and will be five inches thick throughout. Teak backing, of a minimum thickness of three inches, will be fitted behind all side armour, and two inches thick behind 10-inch turret armour; other armour will be fitted without backing.

The 10-inch guns will be in pairs, in two electrically-controlled, balanced, elliptical turrets, on the centre line, one forward and one aft, each with an arc of fire of about 270°. Four of the 6-inch guns will be in independent casemates on the main deck, the remainder in broadside on the gun deck, all on pedestal mounts, those on the gun deck behind five inches of armour, each gun being isolated by splinter bulkheads of nickel steel; casemate guns on main deck behind five inches of armour in front, and with two inches of nickel steel for protection in the rear. There will be four of the 6-inch guns at ends of battery arranged to fire right ahead or right astern respectively; other 6-inch guns to have the usual broadside train. All of the 6-inch guns will be so arranged that their muzzles will train inside the line of side armour, thus leaving a clear and unobstructed side when it is desired to go alongside a pier or vessel. Six of the 3-inch guns will be mounted in sponsons on the gun deck, six in broadside on the gun deck, and ten in broadside on the main deck.

There is a complete protective deck extending from stem to stern, built up of twenty-pound lower plating throughout, with nickel steel of 100 and 140 pounds on slope and forty pounds on the flat, except over the magazines, where it will be sixty pounds forward and abaft 10-inch batteries.

Ammunition: Magazines and shell-rooms are so arranged that about one-half the total supply of ammunition will be carried at each end of the ship. The vessel will be equipped with the latest electrical machinery

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for ammunition hoists, refrigerating plant with a cooling effect of four tons of ice per twenty-four hours, boat cranes, deck winches, turret-turning motors, ventilation fan motors, etc.

The engines will be of the vertical twin-screw, four-cylinder, triple-expansion type, of a combined I.H.P. of not less than 23,000, and arranged for out-board turning propellers when going ahead. The steam pressure at the engines will be 250 pounds. The stroke will be four feet. The cylinder diameters will be sufficient for the required I.H.P. at about 120 revolutions per minute. Each engine will be located in a separate water-tight compartment. The usual steam auxiliaries will be provided.

There will be sixteen water-tube boilers, placed in eight water-tight compartments. There will be not less than 1,590 square feet of grate, and not less than 68,000 square feet of water-heating surface. The working pressure will be 265 pounds. The steaming capacity will be such that all steam machinery on board can be run at full power, with an average air pressure in the fire-rooms of not more than two inches of water.

There will be four funnels, each 100 feet high above the base line. All main compartments of the ship below the gun deck, except the coal bunkers, are to be provided with forced ventilation, there being not less than twenty-seven blowers, with a combined capacity of not less than 110,000 cubic feet per minute. The coal bunkers will be arranged with satisfactory reference to the rapid and sufficient supply of coal to the fire-room and for a maximum capacity of about 2,000 tons.

The electric plant will be of not less than 600 kilowatt capacity (no unit to be less than 100 kilowatt capacity), driven either by reciprocating engines or turbines, all generators to be of 125 volts pressure at the terminals, and disposed in two separate and independent dynamo rooms.

All the usual means of interior communications will be fitted, such as telephones, voice pipes, call bells, buzzers, gongs, annunciators, engine and steering telegraphs, revolution and rudder indicators, heeling indicators, fire alarms, warning signals, alarm signals, turret-hoist indicators, electric logs, etc.

There will be a lower bridge both forward and aft, and a flying bridge forward. On the flying bridge will be fitted a screen and the steering wheel, engine telegraphs, indicators, voice tubes, telephones, and all fittings for handling the ship. There will also be a chart house and emergency cabin suitably located.

The ship will have two steel masts, the foremast having an upper and lower top, the mainmast a lower top only. Masts will be arranged for wireless telegraphy, and fitted with a signal yard on each mast; also a search-light platform forward and aft, with a look-out platform on foremast.

There will be approximately twenty-three sliding water-tight doors and four armoured hatches, which will be worked on an approved power system. The vessel will cost, exclusive of armour and armament, 3,575,000 dollars.—*U.S. Army and Navy Journal.*

Wire Gun Trials.—The final tests of the Brown segmental tube wire gun were recently concluded at Sandy Hook, according to the programme of the Board of Ordnance and Fortifications. There were ten high-pressure shots; these ten shots were the eighty-ninth to the ninety-eighth in the series of ninety-eight shots from the beginning of the tests. The tests were

with 106-pound capped armour-piercing steel projectiles. The powder was smokeless, and the results with the various charges were as follows :— United States

Shots.	Charge.	Pressure.	Muzzle Velocity.
1.	75	50,101	3,514 feet seconds.
2.	74·50	51,838	3,519 feet seconds.
3.	74	52,461	3,546 feet seconds.
4.	73	48,672	3,470 feet seconds.
5.	75·25	52,019	3,529 feet seconds
6.	76·50	54,064	3,614 feet seconds
7.	78·50	58,166	3,670 feet seconds.
8.	80	58,843	3,740 feet seconds.
9.	81·50	59,714	3,689 feet seconds.
10.	84	64,483	3,723 feet seconds.

These tests are in competition with the Crozier wire-wound gun, which has been fired thus far sixty-six rounds in the test of one hundred rounds with the same projectile and powder. The Crozier gun lost its breech block in the fire at Sandy Hook some months ago, and is now at Watervliet. It is satisfying to know that both of these two guns now undergoing test, whatever their relative merits as compared with each other, are superior to any other wire-wound guns.—*U.S. Army and Navy Journal.*

Bureau of Steam Engineering.—Engineer-in-Chief Rae, Chief of the Bureau of Steam Engineering, U.S.N., with the rank of rear-admiral, in his annual report states that his expenditure for the year has been 3,567,470 dollars 70 cents, of which he has on hand 437,529 dollars 30 cents to meet outstanding obligations. In addition to the usual routine work, the Bureau has been occupied with the plans for the machinery of the battle-ships "South Carolina" and "Michigan," the tugs "Patapsco" and "Patuxent," seven 65-foot launches for Cavite, a ferry-boat for the Portsmouth Navy Yard, and a lighter at Indian Head; also for new boilers for the "Massachusetts" and "New York," the tugs "Iwana," "Choctaw," and "Tecumseh," and new boilers and condensers for the "Bailey." Four types of machinery for 50-foot launches are building; the ones with steam turbines are near completion. The Bureau is designing a new type in eight sizes of standard evaporators and an improved type of engine for steam launches, and it is also studying the problem of turbines, probably the most important engineering problem of the day, and is experimenting with turbine machinery. It proposes to wait for the adoption of the turbine until it has been shown to be unquestionably the best system of propulsion for naval purposes. Five gasoline motors, of 10, 12, 25, 75, and 300-H.P., have been installed, and investigation has also been made along the line of the double-acting gasoline motors now building by the Standard Motor Construction Company, in which the weight of machinery per H.P. has been considerably reduced.

The nature of the work done at the several navy yards is described in detail. A title to the site of the experiment station at Annapolis, Md., has been obtained, and the foundations of the first building are nearly completed. An experimental boiler has been temporarily installed in one of the old buildings of the Navy Academy, and the work of preparing for experimenting with turbine engines is under way. Perhaps when the experiments are completed, the Cunard Company and the British Government will learn, when it is too late, that they have made a mistake. It

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is possible also that we may learn, when it is too late for us, that we have been over-cautious. This report says :—

"It is expected that the tests and experiments made with these turbines will afford considerable valuable *data* for use of the Bureau in connection with the designing of turbine installations for naval vessels. The operation of the turbines will also afford useful practical instruction to midshipmen and mechanics prior to the detail of the latter to ships fitted with such machinery."

There has been a considerable falling off in the total weight of material inspected, and delay in inspection has been avoided by employing retired officers. A tabular statement of the machine *data* of United States naval vessels concludes the report.—*U.S. Army and Navy Journal.*

Cost of Armour Plate.—The Navy Department has submitted to Congress the full report of the Armour Board appointed last year to make a report as to the cost of the manufacture of armour plate. This report is of the utmost interest to officers of the Navy. The Board considered the subject under the headings of "production cost" and "full cost." Some highly interesting and important *data* were collected by the Board and published in its report. With regard to production cost, the Board considered those items which, in a general way, are considered to be without the control of the armour manufacturers. They are those items of cost incident to armour making that may be termed more or less fixed and necessary, no matter where or by whom the armour plate may be made. These fixed costs are, in detail, the price of all raw materials composing armour-plate, and of all material consumed in its production; the cost of all labour necessary or incident to the conversion of this raw material into finished armour plate; the cost of the upkeep of the plant; and the current repairs necessary to its maintenance in proper workable order; the salaries paid the necessary superintendent forces, as distinguished from wages for labour, and the interst on the working capital involved.

The Board reported that in order to obtain the full cost of armour plate to any private concern, there must be added to the production cost a proportion of the general administrative expenses of the whole works, taxes, and insurance on the plant, and a host of general miscellaneous expenses that cannot readily be itemised. The Board reports that changes in the processes of manufacture may require the installation of new equipment; or improved methods of production may make obsolete equipment maintained in current working order; so that the Board regards it as proper that a further charge be added, making provision for such a general depreciation of the plant. This charge is to be distinct from the current wear and tear of plant provided for in the maintenance charge under production cost, which recognises its possible total abandonment through a lack of any demand for armour or by reason of the discovery of some superior and radically different method of production.

The Board assumed a plant of 6,000 tons annual capacity, valued at 3,750,000 dollars, and allowed a working capital of 750,000 dollars. The Board estimated that the "production cost" for Class A armour was 244 dollars 27 cents; and the "full cost" per ton of armour plate for Class A armour was 295 dollars 89 cents. The production cost for Class B armour is 221 dollars 76 cents; and the full cost for Class B armour is 273 dollars 38 cents. The estimated "full cost" of armour includes only such actual charges against armour making as must be considered by any manufacturer in fixing a selling price that will provide for interest on any bonded indebtedness and a fair profit for the whole money invested.—*U.S. Army and Navy Journal.*

MILITARY NOTES.

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The following are the principal appointments which have been made :—

Major-Generals—Sir J. W. Murray, K.C.B., to be a Divisional Commander in India. A. A. Barrett, C.B., I.A., to be a Brigade Commander. Sir C. Ashburnham, K.C.B., to be Colonel-Commandant The King's Royal Rifle Corps. R. S. S. Baden-Powell, C.B., to be Lieut.-General.

Colonels—J. B. Forster, from h.p., to be a Brigadier-General to Command a grouped Regimental District (also Officer in Charge of Records). F. Macbean, C.V.O., C.B., Commanding the Highland grouped Regimental District, to be an A.D.C. to the King. J. G. Ramsay, C.B., I.A., to be a D.A.G., and is granted the temporary rank of Brigadier-General whilst so employed. A. N. Rochfort, C.B., C.M.G., to be Major-General. U. G. C. de Burgh, C.B., from h.p., to be an A.A. and Q.M.G. H. F. Mercer, C.B., to be an A.A.G. at Headquarters.

Notes Concerning Soldiers' Messing. (Communicated by Major C. B. Levita, M.V.O., R.F.A.).—It may be a gross libel to state that the nearest way to a man's heart is down his throat; but, if we translate the word "heart" to mean the amount of heart he puts into his work, then it must be conceded that a good, ample, and comfortable system of messing is of great importance to the soldier. Man must eat to live and there is no reason why that frequently recurring function should not be conducted, even by a soldier, under conditions which render it both pleasant and economical.

Until comparatively recently, however, soldiers' messing has been generally carried out under conditions which cannot even be described as satisfactory. The State only recognised its obligation to fulfil its contract with a soldier by providing him with a pound of bread and three quarters of a pound of meat, and with inadequate means of preparing and serving that modicum of food. The rest, and it is considerable, was provided by the soldier himself. Small groups of men messed together, and those who managed the food supply of these groups also frequently managed that they themselves should not be losers thereby. Efficient control by officers under such circumstances was a matter of considerable difficulty, even though it was recognised that the hardest duty an officer has to perform is to see that the soldier gets in all things what he is entitled to receive. Now, happily, times are changed. The State gives its soldiers ample food and some requisites to supplement it. Units vary in the method of administering their messing arrangements, but, generally speaking, in soldiers' messing, as in other things, it is recognised that co-operation spells efficiency and economy. "L'Union fait la force."

Now, whilst in no way wishing to unduly extol the system I am about to describe, nor to decry other systems, I desire to record what is perhaps a novel experiment. After careful consideration I decided to make this experiment, and now, after a couple of years' trial, have pleasure in both recording that I believe it to be an unqualified success and in making some general remarks engendered thereby. The men, who, after all, are

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the best judges in such case, are enthusiastic about it; older N.C.O's. express surprise at the good and cheap living; attached men of other units are strong in their appreciative remarks.

Undoubtedly a battery of artillery is for such purposes an admirable unit, but there is nothing to prevent other units so messing if desired. The main principle of the system lies in a combination of compulsory and of voluntary charges. The adaptation of the barrack room mess to the ordinary restaurant: the admixture of soldiers' mess and of coffee shop.

It is essential for any modern system of soldiers' messing that there should be a separate room maintained for feeding purposes. This is often a difficulty, but it would be preferable to overcrowd barrack rooms so as to obtain a dining room, than to revert to the old system of feeding in different rooms with its attendant abuses. Moreover, men absent on duty from meals can be properly fed on return. It is advantageous that the room should have a lock-up bunk, or adjunct, for stores.

An initial cost must be faced to provide the necessary equipment, for the necessities of neither kitchen nor of dining hall are adequately supplied by the country. For the kitchen must be purchased saucepans, frying pans, soup ladles, skimmers, mincing machine, meat safe, etc., etc. For the dining hall certainly crockery, so far as plates and basins, is provided. But it is poor economy to even draw these from the barrack stores, as the replacement of breakages is a ruinous item. It is very desirable that the Government should issue enamel ware instead of compelling its purchase privately. The dining hall requires at least two plates and a mug for each man; also joint dishes, teapots, salt, pepper and mustard pots, water bottles and tumblers, carving knives and forks, bread baskets, dish-cloths, etc., etc. It is advisable also to purchase a bread cutting machine which, to obviate damage to many fingers, should be placed in charge of one man. A potato peeling machine is very economical of both labour and of food; the best part of a potato lies near the skin. Barrack room tables may be covered with white oilcloth, or American cloth, which can be scrubbed and is durable. The washing of ordinary table linen is too expensive. Each man on joining gives into the common fund his spoon, knife and fork, and is not required to show any with his kit: he receives them back on leaving the battery. The supply is then kept up from the fund. I reckon the initial cost for a mess of about 120 men to be about £20.

All battery commanders have a battery fund voluntarily subscribed to by all ranks, usually in proportion to their pay, from which such benefits to the men are provided.

All bread and meat drawn are pooled. That is to say no man handles his rations except in the common mess. Bread is cut up and placed on the tables as required. Usually about one-third of the bread is sliced for breakfast, a little for dinner, and the remainder for tea. But there is no stint of bread at any meal. Bread is the cheapest food that can be supplied, so, whenever more is required it is, if necessary, purchased. Young soldiers eat more bread than the older men, therefore the amount of bread consumed varies directly as the service of the unit. As a matter of fact, however, there is generally an excess of bread. This is available for the cookhouse for puddings, sausage meat, etc.

Sometimes arrangement is made with the contractor to reduce the quantity of bread drawn and to draw flour in lieu. Similarly it is often advantageous to privately arrange with the butcher to vary the meat by supplying pork, veal, bullocks' heart, liver, etc. I might here remark that it would be of great advantage to the soldiers' messing, if the basis of issue of his rations was similar to the new system of issue of forage. In the

latter the pecuniary value of the forage, if not drawn, is carried forward as a credit. Varying forms and quantities of forage to suit requirements can thus be arranged for. But with the soldiers' rations, any rations, in excess of five, underdrawn at the end of the month can *never* be drawn. Rations overdrawn, on the other hand, are debited to the unit and must be paid for. This arrangement is neither equitable nor generous, and should cease. If a soldier's rations were to be treated on a basis of a pecuniary value then, during each month the requirements of messing could be dealt with at no extra expense to the State and with great benefit to the soldier.

The staff employed in connection with the messing is as follows:—In the cookhouse, one cook and an assistant under training. Neither of these men are struck out of messing, indeed, no man in the battery is struck out of messing unless he is away for four clear days, and the number of men allowed to live out of mess is strictly supervised. In the dining hall there is one man in charge, who administers the extra food as described later, and is responsible for the cleanliness and preparation of the dining room and its contents. He is assisted by the cook's mates or room orderlies for the week. Those men are also responsible for carrying meals from the cookhouse and for carving and serving at the sideboard. Men entering the dining room take seats and are waited on by the room orderlies of the previous week, for it is necessary to prevent men from crowding around the serving tables to ensure satisfactory results. Of course these waiters are not struck off duty, but they leave stables five minutes before the other men so as to enable them to get a wash and be ready for their duties when the rush comes. The pay sergeant controls and arranges the messing and its finances under the immediate supervision of the Battery Commander. All bills are paid by cheque, and discount is by arrangement deducted and credited to the messing fund. A Messing Committee consisting of a representative from each barrack room, selected by the men, of the dining hall man, and of the cook, meet the Battery Commander at irregular intervals and are encouraged to bring to notice anything and everything that may tend to improve the messing and add to the comfort of the men. The cursory visit of an orderly officer with his useless formula of "any complaints" is hereby obviated, although supervision by officers is not relaxed. The committee is of great assistance; for instance, the arrangement, already mentioned, for waiting was their proposition.

As regards the actual diet, there is a sample diet sheet attached, but it must be realised that this sheet only gives the free food provided. Extras which the men call for are not shown thereon.

Butter is always provided for both breakfast and tea. At the request of the men, through the Messing Committee, the messing was raised ½d. a day so as to ensure this, bringing the messing stoppage to 4½d. per diem. As 3d. of this money is specially given as a grocery allowance, or aid to extra messing, by the country, it follows that the soldier only pays three-half-pence a day for his food. In no other walk of life can a man live nearly so well at the cost of 1½d. a day. The soldier's pay to-day is sufficient, and not only are soldiers able and willing to pay a high messing stoppage if properly administered, but, considering how an extra 1d. a day means a wonderful improvement in messing and leaves less money to spend on drink and women, I regret that a higher messing stoppage is not compulsory, and not as at present, discouraged. There can be no question as to the fact that the soldier's health would thereby be improved.

Home. To return to the diet sheet, breakfast is a substantial meal, and, in addition to other things, is daily supplemented by plenty of rolled oats porridge (1s. 11d. per stone). Dinner presents a choice of various joints. There are always soup, two vegetables, pudding, and cheese. The usual pernicious decoction of stewed tea is tabooed. Obtained direct from the growers (1s. 4d. per lb.), and as used in the officers' mess, it is fresh made in pails and transferred to the tea pots on the tables. Coffee if soaked overnight gives an essence immediately ready for use with boiling water. Sufficient dripping can be made both for cooking and occasional eating purposes. Bones, in nets with tallies on them, form the basis of soups. The tea meal, on paper, looks small, but here it is that the system of extras particularly comes into use.

The dining hall bar stocks all such food and non-alcoholic drink supplies as the committee desire to have, subject to my personal objections to certain classes of tinned foods. For instance, hot supper dishes—dried and fried fish—cold meats, ham, cakes, fruit, jam, pickles, sauces, biscuits, cheese, mineral waters, sardines, potted meats, etc., etc. The pay sergeant issues one penny, and half-penny, tokens which the men sign for and have debited to their accounts. It is advisable to give good facilities of obtaining these. Thus, even at meal times, tokens can be procured by signing for them. No cash is taken, nor are checks convertible into cash, but a locked till is provided for the checks. The dining hall keeper receives as monthly payment 10 per cent. of the profits from his sale of extra messing. The bar, not intended for, nor used as, competition to the regimental coffee shop, is but for use at meal times. Men call for what they require with their meals and are thus enabled to humour their tastes far beyond what any normal system of messing can do. The regimental canteen is as far as possible dealt with for all supplies, but it often happens that, by purchasing quantities of goods from growers or in the market, they can be obtained cheaper elsewhere. The cheapest and best is purchased wherever it can be found,, both for use in the cookhouse or for retail at as near cost price as possible.

As regards accounts, one general messing fund is kept. On the credit side are entered the men's total daily messing subscriptions (4½d. per man), the rebate from the canteen, the sale of refuse, and the sale of checks. On the debit side are recorded all bills paid in connection with messing, the 10 per cent. on sale (already mentioned), and rations overdrawn. In fact, the general messing fund is concerned solely with consumable supplies. Utensil up-keep and cook's wages (10s. a month) are charged to the battery fund. A monthly statement of the bar is also kept. This shows on the credit side sale of checks and stock in hand at the end of a month. The debit side presents stock in hand of preceding month and cost of all stock received during the month, and, the value of such articles as may be provided free to the dining hall (such as butter, cheese, jam, etc.). This statement averages a profit of £5, which represents the cash benefit added from this source to the general messing fund. The daily average number of men messing for the past year has been 90.

There is no objection to men fetching their own beer from the canteen for consumption at dinner, but, of course, it is a personal cash transaction with the canteen. In practice, however, it is a privilege very seldom made use of.

The absence of provision of extra white clothing for the cooks, etc., and the fact that only 40 lbs. of rag per annum are allowed for cleaning purposes, add to the expense and difficulties of ensuring that scrupulous cleanliness which is so desirable in the preparation of food.

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King's Regulations state that "it is the duty of the C.O. to see that the soldiers' meals are properly and sufficiently provided." But making bricks without straw is too often a British officer's task. Thus, in addition to various difficulties, already touched on, which have to be overcome to comply with the words quoted, there are two formidable obstacles, namely the inadequate supply of fuel, and of, even partially, trained cooks. As regards fuel it is well known that, even where no extra messing is attempted, the coal supply is scanty. When the restaurant system is developed the coal question becomes serious. The allowance for a cookhouse fitted only with the Warren cooker is 3 lb. per man per week—where other cooking arrangements exist an increase of 2 lb. per man is sanctioned. I find, however, that for an average of 90 men in the cookhouse, which is provided with a Warren cooker and other ovens, at least ten extra boxes of coal, or 800 lbs. per week, notwithstanding due economy, is consumed.

At Aldershot in 1903 my cookhouse was taken over for trials by a staff officer of the G.O.C., together with a sergeant master cook. Every ounce of coal was weighed and the strictest economy practised. The restaurant system was not in use, nevertheless, the report showed that the total allowance of coal for cooking purposes for 120 men for a week with a Warren cooker, viz., 360 lbs., was exceeded by 468 lbs. "Robbing Peter to settle with Paul" is the unsatisfactory solution of the fuel question.

As regards the training of cooks I am of opinion that the subject is worthy of attention. As compared to some foreign armies, British soldiers are lamentably deficient of even such culinary knowledge as will ensure health and comfort at the commencement of a campaign. If teeth and digestion are good they can successfully cope with bully beef, but meat on the hoof fills them only with dismay. In time of peace no practical attempt is made to instruct them in such matters. The school of cookery at Aldershot provides three courses only, of three months each. But these are especially for the appointment of sergeant cooks, and consist of N.C.O's. who must possess 2nd class certificates. Now the value of sergeant cooks is very doubtful: as a personal experience I would state that I have never seen any advantage derived from them in the Royal Artillery, and consider them to be the most overpaid and underworked men in the regiment. Cooking is actually performed by privates and not by second-class certificated N.C.O's. It is, moreover, inadvisable to send a likely man to the course, unless it is desired to lose his services, as generally he passes from the course and the unit, which bore the inconvenience of training him, at the same moment. Moreover, the unit sending him to the course is, by King's Regulations, fined £1. What is required, is to partially train as large a number of men, who find cooking congenial, as possible. To give them a short course of not less than a month, possibly in civilian eating houses, paying a bonus for their instruction. Such practical usage in handling raw food supplies would be of considerable value both in peace and war, and would, moreover, assist men to civilian employment on discharge. Again, in these days of "proficiency pay" surely a proficient cook should be rated and paid as such. I do not undervalue the excellent "Manual of Military Cooking," issued by the School of Cookery, by suggesting that an ounce of practice is worth a ton of theory.

Finally, it is perhaps worthy of remark that officers, desiring to change their system of messing, should realise that the reformer who is only opposed by "passive resisters" may be deemed fortunate.

128TH BATTERY R.F.A.

Home. *Compulsory Messing at 4½d.—Scale of Diet for Week ending 5th Jan.*, 1907.

Sunday.	Monday.	Tuesday.	Wednesday.	Thursday.	Friday.	Saturday.
BREAKFAST.						
Tea, Bread, Butter, Porridge, Steak and Tomatoes.	Tea, Bread, Butter, Porridge, Eggs and Bacon.	Coffee, Bread, Butter, Porridge, Beef Rissoles.	Tea, Bread, Butter, Porridge, Finnan Haddocks.	Tea, Bread, Butter, Porridge, Steak and Onions.	Coffee, Bread, Butter, Porridge, Bacon and Onions.	Tea, Bread, Butter, Porridge, Fried Fish.
DINNER.						
Tomato Soup, Roast Beef, Meat Pie, Potatoes, Mixed Vegts., Bread and Butter Pudding, Cheese.	Julienne Soup, Roast Beef, Toad in the Hole, Potatoes, Savoys, Stewed Apples & Custard, Cheese.	Ox Tail Soup, Roast Mutton, Rabbit Pie, Potatoes, Brussels Sprouts, Suet Pudding and Treacle, Cheese.	Pea Soup, Roast Beef, Brown Stew, Potatoes, Mixed Vegts., Macaroni and Figs, Cheese.	Macaroni Soup, Roast Beef, Cottage Pie, Potatoes, Savoys, Bread and Butter Pudding, Cheese.	Lentil Soup, Irish Stew, Bullocks' Hearts, Potatoes, Mixed Vegts., Stewed Apples & Custard, Cheese.	Tomato Soup, Roast Beef, Meat Pudding, Potatoes, Savoys, Mince Pies, Cheese.
TEA.						
Tea, Bread and Butter.	Tea, Bread and Butter.	Tea, Bread and Butter.	Tea, Bread and Butter.	Tea, Bread and Butter.	Tea, Bread and Butter.	Tea, Bread and Butter.

MENU FOR XMAS DAY, 1906.

Ox-Tail Soup. Rabbit Pie. Roast Beef.
Roast Turkey. Roast Pork.
Boiled Ham. Potatoes. Brussels Sprouts.
Plum Pudding. Mince Pies.
Cheese. Celery. Oranges. Apples.
Bananas and Nuts.

Voluntary Messing. (Tokens only—no cash).

LIST OF ARTICLES SOLD IN THE DINING HALL OF THE 128TH BATTERY R.F.A.

Biscuits.
Cheese.
Jam.
Cakes.
Pickles.
Fried Fish.
Bloaters.
Finnan Haddocks.
Kippers.
etc.

Liver and Bacon.
Eggs.
Sausages.
Tinned Sardines.
Tinned Meats.
Boiled Ham.
Corned Beef.
Fruit.
Celery.
etc.

etc.

Army Reorganization.—The following India Army Order has been published :— India.

With the approval of the Secretary of State, and under the sanction of the Government of India the present Commands—Northern, Western and Eastern—will cease to exist from the 1st June, 1907, and the Army of India will from that date be divided into two portions, viz., the Northern Army and the Southern Army, each under command of a General Officer, provided with a suitable Staff. The Northern Army will comprise Peshawar, Rawalpindi, Lahore, Meerut and Lucknow Divisions, and the three independent Frontier Brigades of Kohat, Bannu and Derajat. The Southern Army will comprise Quetta, Mhow, Poona, and Secunderabad Divisions, with the garrisons of Burma and Aden.

The duty of the General Officers appointed to command each Army will be to ensure general uniformity in training and discipline in the Divisions under his command, and he will be responsible to the Commander-in-Chief for the efficiency of all units of the Army under his command, and its services, and for the promotion of officers to the extent to which this has hitherto been exercised by Lieutenant-Generals of Command. All administrative work that has hitherto been performed at the headquarters of the present Commands will, in future, be conducted by the General Officers Commanding Divisions who will exercise full powers that have hitherto been delegated to Lieutenant-Generals of Commands, and will correspond direct with Army Headquarters.

For the purposes of the training, instruction and inspection of troops, and their services and their preparation for war, the General Officer commanding each army will be assisted by a Staff composed as follows : Assistant Military Secretary, Aide-de-Camp; Deputy Adjutant-General (Brigadier-General); Deputy Assistant Adjutant-General; Colonel-on-the-Staff, Royal Artillery (Brigadier-General); Orderly Officer, Royal Artillery, for six months during the training season. (Details of the clerical and menial establishments authorised for the staff of each Army will be communicated hereafter.)

A Staff Captain to assist in matters connected with intelligence, mobilisation, and internal defence, will be added to the existing Staffs of each of the six undermentioned Divisions : Peshawar, Rawalpindi, Lahore, Quetta, Poona, and Lucknow.

The Commander-in-Chief is further pleased to announce that five Brigadier-Generals and one Colonel on the Staff have been added to the establishment. The following six new Brigades will accordingly be formed :—

Northern Army.—Peshawar Division, Infantry Brigade, including Peshawar, Cherat and Jamrud. Rawalpindi Division, Infantry Brigade, including Rawalpindi and Murree Hills. Lucknow Division, Infantry Brigade, including Lucknow and Sitapur.

Southern Army.—Quetta Division, Infantry Brigade, including Quetta. Poona Division, Infantry Brigade, including Poona and Kirkee. Secunderabad Division, second Infantry Brigade, including Secunderabad. One Brigade Major will be appointed to each of the above Brigades.

Of the 24 First-class and 13 Second-class stations, the Staff Officers, sanctioned at present for twenty of the former and all of the latter, will be retained in future. The 20 First-class Station Staff Officers will be distributed for station duties at the following stations : Peshawar, Rawalpindi, Lahore Cantonments, Meerut, Lucknow, Quetta, Mhow, Poona, Secunderabad, Maymyo, Bannu Murree, Dalhousie, Kasauli, Landour, Chakrata, Naini Tal, Darjeeling, Pachmarhi, and Wellington. Of the 13

India. Second-class Station Staff Officers, one will be allotted for station duties to each of the following stations: Nowshera, Jullundur, Umballa, Karachi, Nasirabad, Bareilly, Jubbulpore, Jhansi, Aden, Bangalore, Mandalay, Rangoon, and Kohat. The Staff Pay of these Station Staff Officers will in future be as follows: 1st Class, Rs. 200 per mensem; 2nd Class, Rs. 150. These rates of Staff Pay will not carry exchange compensation allowance.

The additional Assistant Adjutant-Generals and Deputy Assistant Adjutant-Generals, who have hitherto been appointed for Musketry to the Staffs of the three Commands, will from the 1st June be distributed in four circles. For the First Circle, including Peshawar, Rawalpindi, and Lahore Divisions, Kohat, Bannu and Derajat Brigades, there will be one Assistant and one Deputy Assistant Adjutant-General with a school at Satara and Rawalpindi. The Second Circle, including Mhow, Meerut and Lucknow Divisions, will have one Assistant and one Deputy Assistant Adjutant-General with a school at Pachmarhi. The Third Circle, including Quetta, Poona, Secunderabad Divisions and Aden Brigade, will have one Assistant and one Deputy Assistant Adjutant-General with a school at Satara; and the Fourth Circle, including Burma, one Deputy Assistant Adjutant-General with a school at Maymyo.

The above Musketry Officers will have charge of the Musketry Schools in their respective circles, and when not engaged in instructional work in the schools will assist General and Commanding Officers in the general musketry training of the troops in their circles. They will divide their time for that purpose as may be required, and they will not be employed on any of the ordinary routine work in the divisions. All orders regarding the assembly of classes at schools in the First, Second, and Third Circles will be issued by the General Officers Commanding the divisions in which the schools are located (*viz.*, the General Officers Commanding Rawalpindi, Mhow and Poona Divisions respectively), in communication with the General Officers Commanding the other Divisions or independent Brigades.

The following officers of the Judge Advocate-General's Department will, from the 1st June, 1907, be attached to the staff of each of the General Officers Commanding the Northern and Southern Armies: one Deputy Judge Advocate-General, one Assistant Judge Advocate-General. One Assistant Judge Advocate-General will also be attached in future to the staff of the General Officer Commanding Burma. Officers who at present hold substantive appointments as Deputy Judge Advocate-Generals in excess of the establishment mentioned above, will receive the pay and allowances of their existing appointments until absorbed.

Pending further orders the officers and establishments of the Military Works, Supply and Transport, Medical and Veterinary Services in the Commands will remain as at present. The Officers and establishments of the Ordnance Department, Recruiting Staff, Gymnastic Staff, Army Schools, Army Signalling, and Mounted Infantry Schools are not affected by this Order.—*The Pioneer Mail.*

China. *Army Reform in China.*—A small party of 15 Chinese students left Shanghai in April last bound for France. The dispatch to Japan, Europe, or America of young Chinese, bent on acquiring foreign knowledge, has long since lost novelty, but there are circumstances which render the departure of the little band to whom reference is now made of considerable general interest. Though very little fuss has been made concerning them, they represent the advance guard of what it is hoped to make the nucleus of the new Chinese Imperial Army. They are sent neither by a potent Viceroy nor by the enterprise of influential friends,

China.

but they go on the bidding of the Central Government' Ministry for War, the *Luchunpu*, by whose officials they have been specially selected. All have enjoyed already rather more than two years' training in the Military College at Poa-ting-fu. On arriving in Europe they will be drafted into the ranks of the French Army, where they will undergo the exact discipline of every conscript; thence they will pass, according to merit, into various French Military Colleges for instruction in the higher departments of the work: in the handling of men, in tactics and strategy. Colonel W. S. Y. Ting, Judge Advocate-General of the Chinese Imperial Army, a particularly brilliant officer, who has already travelled much abroad and speaks and writes several foreign languages, accompanies the party on its journey; but it is understood that on reaching their destination no special provision (beyond the payment of one franc a day) will be made for the students, who will have to pass "through the mill" completely. In this respect their lot will be very different from that of Chinese military students in the past, who had generally been attached as sub-lieutenants to various regiments, supplied with money far beyond necessary requirements, and given every opportunity for enjoying themselves, without much regard to practical study. In the present instance confidential reports on the progress of the students will be made from time to time through the Chinese Legation.

It is understood that the arrangements between the French and Chinese Governments leading up to the present expeditions date back from the stay of the Travelling Commissioners in Paris. If, as is at all events more likely than of some previous ventures, they prove successful, similar arrangements will, no doubt, be made with the military authorities of other Western nations, and at all events other parties will be sent abroad under corresponding conditions. Although the transfer of the general control of China's military forces from the provincial to the Imperial authorities is as yet only tentative, there is, we are led to believe, already a distinct improvement in the *moral* of the troops themselves. As a part of the very noticeable movement among the people of the Empire, the raising of the military forces in popular esteem is slowly but steadily taking place, and the end in view has been distinctly furthered by the reorganisation under central headquarters. To achieve that purpose there must necessarily be some personal sacrifices, and the atmosphere of intrigue which surrounds all that occurs at Peking has made it doubtful to what extent the changes have been genuinely designed with patriotic motives, or how far they have resulted from the triumph of one great official over another. The balance of opinion, as far as we have been able to gather it from Chinese military sources themselves, is that there is growing up a consciousness at last among the younger generation that a National Army is something to be desired, and that, being desired, it can be brought into existence.

In criticising the manœuvres at Chang-teh-fu last autumn, we expressed doubt as to the value of operations of this character until the troops available have been given a much sounder grounding in military work. This opinion, which was shared by other foreign observers, has, we learn, been accepted by the authorities to the extent that no grand manœuvres will be undertaken this year. There will, however, be camp and field work on a smaller scale by the various divisions, and while what is done will be less showy, it will probably be of much greater benefit than the carefully rehearsed sham fights of the last two years. As a further proof that the reorganisation of the Empire's forces is being seriously undertaken we are informed that the question of re-arming

China. the whole of the troops with uniform equipment is engaging careful attention. The choice of the most serviceable modern weapon is now under consideration. It would be unsafe, of course, from these indications to predict that Army reform, any more than any other reform in China, is certain or permanent. The old disdain of arms, the ancient corruption of which the Army has been one of the chiefest victims, even when China has been engaged in actual warfare, the long-standing provincial jealousies, and many other obstacles which have combined hitherto to make of China's military power a sorry farce, cannot be overcome in a few months. The most encouraging sign in respect of the present attempt at reform is that comparatively little is being said about it.—*The N.C. Herald* and *S.C. and C. Gazette.*

France.

Disciplinary Companies.—These companies receive men who, either before or after enlistment, have voluntarily mutilated themselves to avoid military service, or who have taken part in collective acts of indiscipline, or whose conduct has been presistently depraved and scandalous, and on whom ordinary methods for improvement and repression have been exhausted without success.

The Ministerial Instructions of the 12th November, 1902, thus defines the object for the formation of disciplinary companies:

"The special object of the formation of disciplinary companies is to furnish the military authorities with the means for the correction of men impervious to ordinary disciplinary action, by a severe *régime* and by moral reform of their military education, chiefly when their bad conduct is scandalous and is a dangerous example to their comrades."

The following is the procedure laid down, by the instructions quoted above, for the despatch of soldiers to the disciplinary companies: "When the commander of an administrative unit is of opinion that a soldier under his command should be sent to the disciplinary companies, he forwards a written report on the subject to his immediate superior, stating the soldier's crimes, the ordinary disciplinary punishments he has been awarded, and the occasions of relapse which give his usual conduct a character for perseverance dangerous alike to military order and to the police of the corps.

Organisation of the Companies.—There are four disciplinary companies, the headquarters of which are at the following stations: 1st Company at Gafsa; 2nd Company at Biskra; 3rd Company at Mecheria; 4th Company at Aumale. All these companies have detachments, the principal ones are those of Matmala (1st Company), Touggourt (2nd Company), Ain Sephra (3rd Company), and Bon Saada (4th Company).

To these units may be added the disciplinary sections of certain special corps, viz., native riflemen, foreign legion, and African light infantry battalions.

The disciplinary companies are divided into sections corresponding to the three disciplinary categories. The men, on arrival, are placed in the *fusiliers' sections*, where they are subject to the ordinary *régime* of disciplinary corps. There they are, in a manner, under observation. After three months with the company fusiliers who have conducted themselves well, and who evince a sincere contrition, may be passed into the *transition section* by order of the company commander. There they remain, as far as possible, under the same conditions of existence as obtain in ordinary

units. They receive pocket money and may walk out freely during certain hours of the day. Should their behaviour continue satisfactory their names are brought forward for redrafting into a unit of their branch of the service. An act of courage or devotion may also carry this privilege with it. In the new corps to which they are attached, they receive, on their final liberation, a new pocket-ledger which makes no mention of their time in the disciplinary companies.

But in the same way as it is advantageous to isolate the better men in order to facilitate their improvement, it is equally indispensable to do the same with the worst characters to prevent them from altogether corrupting the weak and vacillating. The *pioneers' sections* answer to this necessity. Men whose conduct is particularly bad are brought before a Disciplinary Board, who decide on their drafting to the pioneers. Naturally, the discipline of these sections is much more severe than that of the fusiliers. It is in the former that the most frequent and the gravest acts of indiscipline are committed, and there, too, the repression of the same necessarily partakes of a more drastic character.

The cadre of each company has the following composition: 1 captain commanding, 4 lieutenants (1 of whom is paymaster), 1 adjutant, 1 sergeant-major, 1 quartermaster-sergeant, 15 sergeants, 1 sergeant-baggagemaster, 1 quartermaster-corporal, 17 corporals, 2 corporal artificers, and 3 buglers.

In order to attract good men to this somewhat unattractive service, certain advantages are offered. Thus re-engaged sergeants of disciplinary companies may, on their request, be transferred, with the rank of adjutant, to an infantry regiment, if their names have been entered for three consecutive years in the promotion list for that rank, and if they have completed eight years' service, of which four have been passed in the disciplinary companies.

The position of sergeants in the African Corps, or in the interior, are reserved for re-engaged corporals who have served for three years in the disciplinary companies to the entire satisfaction of their superiors.—*Précis* from *Armée et Marine*.

Army Budget.—The draft of the Budget of the War Department for 1908 is as follows:—

		francs.	francs.
1st Section—	Home Troops	684,625,321	
2nd „	Colonial Troops... ...	35,123,915	777,025,836
3rd „	New Constructions ...	20,103,100	
4th „	Extraordinary Expenditure	37,173,500	

The Budget for 1907 was as follows:—

1st Section—	Home Troops	669,829.233	
2nd „	Colonial Troops	33,848,390	779,986,139
3rd „	New Construction ...	22,061,776	
4th „	Extraordinary Expenditure	54,246,740	
The budget of 1908 therefore, with regard to that for 1907 shows a decrease of			2,960,303

1st Section.—Home Troops.

The normal effective for the 1908 Budget shows the following differences with regard to that for 1907:—

France.

—	Regular Army.		Gendarmerie.		Horses.
	Officers.	Rank & File.	Officers.	Rank & File.	
1908	28,647	547,528	677	24,135	140,775
1907	28,872	549,800	677	24,135	141,055
Decrease in 1908	225	2,272	—	—	280
	— 2,497		—		— 280

2nd Section.—Colonial Troops.

The following table shews the difference between the Budget for 1908 and that for the previous year :—

—	Officers.	Rank and File.	Horses.
1908	1885	25,724	1,589
1907	1852	25,716	1,573
Increase in 1908	53	8	16

3rd Section—New Constructions, and 4th Section—Extraordinary Expenditure.

The credits asked for the 3rd and 4th Sections for the Budget for 1908 amount to a total of 57,276,600 francs, which are thus distributed :—

3rd Section—New Constructions and Reserve Supplies	20,103,100 frs.
4th Section—Extraordinary Expenditure	37,173,500 „
Total	57,276,600

Compared with the credits opened for 1907 by the Financial Law of 30th January, 1907, which were 76,308,516 francs, they shew a nett decrease of 19,031,916 francs.

These credits are meant for the methodical carrying out of the programme of the various works considered necessary for the defence of the country, and which were commenced in 1906 and continued through 1907.—*Précis from Le Budget Général de l'Exercise*, 1908.

Germany.

The New Regulations for Heavy Artillery.—Since the 28th June, 1906, the German Foot Artillery have been given special regulations for heavy field batteries. This work, the first published on the manœuvres and tactical employment of heavy artillery on the battlefield, lays down that in future every army corps will be provided with a battalion of foot artillery, consisting of four companies with four heavy Q.F. field howitzers, model 1902, calibre 15-cm., or else, but exceptionally, with two companies with four mortars of 21-cm. calibre.

The mortars, of an already old type, are very heavy (about 5,000 kilogrammes or 96 cwt.), and only fire from platforms; placing them in position is a long and complicated matter. These pieces are only suitable for siege warfare, therefore these corps only, which, by the general plan of operations, would have to force the line of hostile frontier forts, would be provided with them.

Germany.

The 1902 heavy howitzers of 15-cm. calibre deserve special mention. The weight of the guns limber is 2,700 kilogrammes (about 50 cwt.), of which 2,000 (about 38 cwt.) is that of the hind carriage; the weight of the ammunition wagon, loaded with 36 projectiles, is 2,900 kilogrammes (about 57 cwt.). These comparatively great weights, nevertheless, permit of short intervals of trot along the roads, and allow for progress across country at the rate of the march of infantry. The new gun has, therefore, a mobility amply sufficient for field service.

The mounting, similar to that of the new Q.F. gun, is provided with a glycerine brake and spring recuperator; it neither slides on the axle nor is brought down to load, has no independent line of sight, and is not provided with shields. In ordinary service the rapidity of fire is three shots a gun per minute. The only projectile employed is a shell, fired at a rate of 325 metres, weighing 39·5 kilogrammes (about 87 lbs.), enclosing 7·3 kilogrammes (about 15½ lbs.) of explosive, and provided with a percussion fuse, with, or without, delay action. Each battery is furnished with an observation wagon with telephones. The length of the battalion in column of route is 1,100 metres (about 1,192 yards). The light columns which form part of the fighting train occupy about 2 kilometres (2,187 yards).

According to the new regulations, "howitzer batteries are employed on the field of battle in the same manner as the other arms. They provide a powerful aid to field artillery in its fight against hostile artillery; their fire may have a decisive importance in the preparations for the attack of an enemy's *points d'appui*, when the latter is either completely deployed or installed in a fortified position."

The German Army Corps always includes 21 batteries of six Q.F. guns each; 3 batteries of 6 light howitzers, model 1898, of 6 guns each; 4 batteries of heavy howitzers, model 1902, of six guns each, or altogether 160 guns, which are all meant to combat the hostile artillery.

Disciplinary Sections.—Germany has corps of labourers (*Arbeiter Abtheilungen*). These sections, which are regular disciplinary corps, have to receive :—

1. Men awarded imprisonment of more than six weeks, and those deprived of their civil rights, when they have undergone their punishment, but without their reinstatement having been granted in the course of the five years following the one in which they should complete their military service. Those who, in the course of these five years, have not completed their punishment, are dismissed from the Army.
2. Voluntary mutilations.
3. Men of the regular army who, having already incurred the punishment of being drafted into the 2nd Class, do not improve and who resist all methods of repression.

The number of these labourers' sections is, at the present time, seven, viz. : four in Prussia, at Ehrenbreitstein, Konigsberg, Magdeburg, and Mainz, one in Saxony at Dresden; one in Württemberg at Ulm; and one at Ingolstadt in Bavaria. The budgetary effective is laid down at 465 men.

Each section is commanded by a seconded captain, assisted by a lieutenant detached from a regiment; these officers receive a special allowance of £1 10s. a month. A sergeant-major and two or three subordinates complete the cadre laid down for the section and receive allowance of £1 and of 16 shillings, respectively, a month. Non-commissioned officers and lance-

Germany. corporals detached from regiments, the former for one year and the latter for six weeks, complete the mobile cadre.

The men of these sections are entitled to the same pay as infantry soldiers, but the money is only issued to them daily by the Squad Commander. Only men who have behaved irreproachably for three months may receive their pay, in lump, every ten days, and are permitted to go out, alone and unaccompanied, during their hours of leisure.

The instructions of the 18th August, 1881, lay down in the following terms the position of men attached to labourers' sections:—

"The labourers' sections consist of men unworthy to serve in the regimental ranks; they are intended for the execution of military works; the men composing them are termed soldier-labourers; that is to say, all being exclusively employed on works, they are, from a disciplinary point of view, subject to all military regulations; men who are directly enrolled in them without having previously passed through the ranks are, without delay, instructed in the rules of the Penal Code and take the military oath.

"Their services should lessen and even altogether do away with those duties which are necessarily imposed on the troops. They are primarily employed on earth works, constructions, and in the upkeep of fortified works and military buildings. They may also be placed at the disposal of the various military departments for work inside their buildings. Only men of good conduct, however, should be employed in arsenals, and especially in the cleaning of arms."

For all these duties the soldier-labourers are kept strictly apart from other soldiers, under the supervision of one of the special non-commissioned officers.

Well-conducted labourers wear, when they are allowed to go out, a tunic with black collar and cuffs, with red piping, instead of the universal tunic; they have neither arms nor caps. Their military training, which is given to them for three or four hours a week, consists entirely of movements without arms; the rest of the time is devoted to fatigues. Commanders of army corps exercise the same authority over labourers' sections quartered in their district as over other troops. At the same time, the Inspector of Penitentiary Establishments is especially charged with the inspection of these sections and reports on them to the War Minister.

Reinstatement.—On the recommendation of commanders of sections and on the favourable report of the Inspector, every man of the labourers' sections may, after having shown improvement by prolonged good conduct, obtain his reinstatement by special decision of the Emperor. Soldiers of the 2nd Class may also obtain it on the recommendation of the regimental commanders. The recommendations are renewed each year during the three years following expiration of the crime which caused their drafting into the 2nd Class. (This punishment carries with it loss of decorations, rights to civil employment, etc. Soldiers of the 2nd Class may not be employed on sentry duty in prisons or on any service of honour, on patrol duty, or in the handling of powder or ammunition.)

Disciplinary Section of the Guards.—This section is not a disciplinary corps, like the labourers' sections; it receives men of the Guards regiments who have deserved the punishment of drafting into the 2nd Class, and who are on that account debarred from service in that crack corps. The *régime* of the disciplinary section consists of both manual labour and of military drills with arms, including target practice. Men drafted into this section thus remain soldiers; they are included in the combatant strength of their corps and re-enter them on mobilization. They retain the uniform of their regiment, but the distinctive badges of the Guards are withdrawn from them.—*La France Militaire* and *Armée et Marine.*

Switzerland.

The New Military Law.—A new military law was recently voted by the Swiss Federal Chambers and was promulgated on the 12th April last. According to it the distribution of the classes is as follows :—

The *Élite* continues, as formerly, to consist of soldiers of from 20 to 32 years of age inclusive, viz. : one class in course of training and 12 trained classes, with the exception of the cavalry, which only consists of 10 trained classes on account of the age of their horses.

The *Landwehr* consists of soldiers who have left the *Élite*, and up to the age of 40 years inclusive, viz. : eight classes (12 of cavalry), instead, according to the old law, of 12 classes and men up to the age of 44, and of 14 cavalry classes.

Finally the *Landsturm* consists of men of from 41 to 48 years inclusive, viz., eight classes, whereas formerly it was from 45 to 50 years of age and consisted of five classes.

As regards officers, the changes are as follows:—Lieutenants of the *Élite* pass into the *Landwehr* and leave it at the same time as their men, viz. : at the end of the year in which they attain the age of 32, whereas formerly it was at the age of 34. Captains, as formerly, serve in the *Élite* until they have completed their 32nd year of age, and in the *Landwehr* up to the age of 44, formerly it was 48. Field officers serve in the *Élite* until they have completed the 48th year of their age, as formerly. This is a minimum, for, with their consent, they may be retained beyond these limits. Finally, in the *Landsturm* all officers serve until they have completed the 52nd year of their age, instead of up to the age of 55, as laid down in the old law of 1874.

Recruit Schools.—The periods of recruits' schools have been considerably increased. The figures which follow include the two days necessary for the organization and disbanding of infantry and cavalry, and the three days for the other branches of the Service which are legally always added to the period for the various calling to the Colours.

——	New Law.	Old Law.
	Days.	Days.
Infantry	67	47
Engineers	68	52
Cavalry	92	82
Artillery and Fortress Troops	78	57
Medical, Veterinary and Commissariat Departments and Transport Troops	63	63

The repetition courses for the *Élite* will be annual; they will last 17 days for artillery and fortress troops, 12 days for infantry and cavalry, and 14 days for the other branches of the Service. Private soldiers and corporals will be obliged to take part in seven repetition courses; those of the cavalry in eight; sergeants and the higher non-commissioned ranks will take part in ten repetition courses in the *Élite*, including those of the cavalry. It may, therefore, be said that private soldiers of the five last classes of the *Élite* will not be called out, except in substitution of a course they may have missed. According to the old law private soldiers were called out every two years during ten years, or five times altogether, with the obligation of taking part in at least four of the callings out; should a course be missed it had to be replaced. The duration of the biennial courses was for 18 days for infantry and engineers, 20 days for artillery, and 23 days for fortress troops. As regards the cavalry, the 10 trained classes of which

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were called out for 12 days every year, its private soldiers and lance-corporals will, in future, only be subject to eight annual callings out of 13 days each. Thus, allowing that he formerly went through his five biennial courses, the infantryman in future will have only one day more to put in, and the engineer will have an increase of eight days. The artillery, on the other hand, has a decrease of two, and the cavalry of 16 days.

Musketry Practice in the Shooting Societies are obligatory for all subaltern officers, sergeants, corporals and men of the *Élite* and *Landwehr* of all branches of the Service armed with the rifle or carbine, otherwise they are called out for rifle meetings of three days' duration without pay. Inspections of arms and clothing for all soldiers are held annually in all the communes, in the spring.

In short, the infantryman will, in future, put in 171 days' service, instead of 151 by the old law; the engineer will have 180 instead of the 156 of the old law; the artilleryman, 190 instead of 177 days; and the cavalryman, 196 instead of 202 days. In these figures are included the days for organization and disbandment, but not days devoted to the inspection of arms and clothing, nor the time devoted to target practice, obligatory every year when the man has no service.

Training of Cadres.—Cadres in Switzerland have to carry out very heavy extra duties, which, however, in no way affect the recruiting, officers in excess being numerous except in a few cantons. Thus, while in the infantry private soldiers put in 171 days' service, the corporal will do 260, the first-lieutenant 450, and the captain 627 days, and field officers much more. According to the new law, soldiers proposed for the rank of lance-corporal or corporal will go through a school of from 37 to 38 days for the cavalry, artillery, engineers and fortress troops, and 22 days for the infantry. The old law demanded 30 days for infantry and engineers, 44 for cavalry, and 37 for artillery and fortress troops.

Newly appointed lance-corporals and corporals will go through, in that rank, a recruits' school, in which they will act as instructors. Non-commissioned officers destined for commissioned rank will go through schools for cadet-officers, the periods of which will be as follows, viz.: 82 days for infantry and cavalry, 83 for fortress troops and 108 days for artillery, and engineers. These schools were formerly 44 days for infantry and fortress troops, 109 for artillery and 62 days for cavalry. Once appointed officers, all must command a section in a recruits' school of their branch of Service. Officers noted for promotion to the rank of captain must go through the following supplementary periods of instruction: A Central School I. for 32 days, and, if they obtain the necessary certificates, the command of a company, battery, or squadron, during the whole period of a recruits' school. It is only after that that they are appointed captains. Under the old law this period was for 43 days. Captains noted for promotion go together through a Central School II. for 52 days, whereas previously it had only been for 43 days. In addition, musketry schools and tactical and scientific courses are held for officers.

Commanders of army corps and divisions and their chiefs of the Staff, fortress commanders, etc., will assist every two years in strategic exercises of 13 days.

Musketry Instruction.—The subsidy to the "Free Shooting Societies" figures in the Swiss budget for 1907 at a sum of 1,336,000 francs, an increase of nearly 200,000 francs on the amount for 1906, and of 600,000 francs on that for 1900. This considerable increase is due, on the one hand, to the constantly increasing number of soldiers who prefer to carry out their

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obligatory annual rifle practice with the Free Societies, and, on the other hand, to the increase of voluntary rifle-practice, for which cartridges are provided at a lower rate than the actual cost price.

At first sight it would appear from these statements that the teaching of musketry had made considerable progress, and that the Swiss soldier thoroughly deserves the compliments which have been showered on him by Herr Bebel, in the German Reichstag, when he declared that from that point of view he was greatly superior to the German soldier. If, however, one is to believe certain Swiss journals, especially the *Allgemeine Schweizerische Militär-Zeitung*, the reality is not altogether in accordance with appearances, and that there is amongst those who are compelled to shoot a very considerable number of men who do not pay proper attention to their rifle practice, and who have no liking for it; in short, men who consider that they have satisfied the letter of the regulations if they lose off the number of cartridges laid down into the stop butts.

This defective state of affairs has occasioned the appearance of various proposals, in the nature of military and even of fiscal orders, such as the creation of instruction courses of musketry for the directors of the Societies; disciplinary powers to be vested in the directors; withdrawal of the subsidy allowed to the Societies, for every rifleman who has not fulfilled the conditions laid down; and finally the calling out of the bad shots for a "supplementary course of musketry." All these methods would appear to be of doubtful efficacy, according to the *Allgemeine Schweizerische Militär-Zeitung*. One cannot count, it says, on the directors, elected by members of the Societies, ever consenting to take disciplinary action. On the other hand, every coercive measure taken against bad shots appears to that journal as likely to border on the employment of certain dishonest methods and likely to provoke a movement of opinion all the more unfavourable as "the worst shots belong almost exclusively to that class who are mostly engaged in the difficult struggle for existence." It would therefore appear grossly unjust to still further aggravate the conditions of that struggle. It would seem better to appeal to their vanity by assembling them, for the repetition courses, in the special classes where they are exclusively occupied with musketry, and where they are isolated from the remainder of their comrades until they have obtained more satisfactory results. Finally, all the riflemen shouldn't be given the same number of cartridges, but far more should be given to the bad shots in spite of the extra expense this measure would involve.

It has been considered desirable to reproduce these few observations, if it is merely to prove that even in militia armies everything is not perfect, and that even apparently satisfactory official statements should be carefully verified and cannot be altogether accepted at their face value.—*Revue du Cercle Militaire.*

CORRESPONDENCE.

NATIONAL AND NON-NATIONAL ARMIES.

To the Editor of the JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION.

SIR,—In the course of Mr. Ellis Barker's most able and instructive lecture on the subject of "National and Non-National Armies," which appears in this month's JOURNAL, I notice one or two statements that appear to require explanation.

He says (page 664) :—"The revolted Americans, and the soldiers of the French Revolution, destroyed the linear tactics, and created the modern loose formations. The latest revolution in tactics and the latest improvements in field fortifications and permanent fortifications were invented by the Boers."

As regards the first part of this quoted paragraph, was it not rather owing to his adoption of *linear* tactics, as opposed to the old column formations, that Wellington was able to defeat these same soldiers of the Revolution on many a hard-fought field in Spain, and finally at Waterloo?

The modern loose formations were not adopted by Continental Powers till comparatively recent years, and are even now the subject of much discussion by the "first military Power." It cannot be denied that the late war in South Africa brought to the front the value of smokeless powder, and the increased range of the rifle, and laid also the basis for much heated controversy as to the advantages and disadvantages of dispersion of guns in action. No doubt, too, the extraordinary nature of the South African terrain, and the mobility of the Boers themselves, necessitated, on our part, very wide extensions, and greatly increased decentralization of command; but to pretend that the guerilla tactics of this war would ever be adopted by us *en bloc* in a Continental war, is to be blind to all the teachings of the Russo-Japanese campaign.

As regards field fortifications, the Boers certainly demonstrated the value of shallow and deep trenches, and sited them, also, with great skill; but what more did they do?

As to their permanent fortifications, where were these erected, for one never heard of them?

It would also appear that Mr. Barker's statement (page 659) that "had the Boers possessed a National Army, instead of a Militia, had their troops possessed a military organisation, discipline, and cohesion, they would very likely have defeated the British Empire, and conquered South Africa," is very far from convincing.

Granted that an improved discipline on their part would have resulted in some of our "regrettable incidents" becoming more regrettable; I question whether a military training, in the European sense, would have more generally benefited them in the long run. Very few European-trained soldiers would have consented to the occupation of extensive fronts with widely scattered men, and absolutely no reserves. Yet these were the tactics of the Boer leaders, and though the chance of decisive victory was therefore denied them, they usually gained their object, such as it was.

I mentioned, above, that modern loose formations have only recently been adopted by Continental armies, I write this advisedly, for though many foreign officers discoursed, by means of pamphlets, etc., on the subject, at the commencement of the last century, they were only put into real practice by Sir John Moore, whose training of the 52nd Light Infantry at Folkestone in 1803, might serve, even now, as a model for this kind of tactics.

Yours faithfully,

"ADJUTANT."

June, 1907.

NAVAL AND MILITARY CALENDAR.

JUNE, 1907.

7th (F.) H.M.S. "Forte" paid off at Chatham.
12th (W.) A Royal Review was held at Aldershot. Their Majesties the King and Queen, and the King and Queen of Denmark were present.
15th (Sat.) Opening of the Second Peace Conference at the Hague.
17th (M.) The Secretary of State for War announced that the Militia would be retained as a distinctive force in his Territorial Army scheme.
26th (W.) Launch of H.M.S. "Inflexible" from Messrs. J. Brown & Co.'s Yard, Clyde-bank.
29th (Sat.) H.R.H. the Princess Henry of Battenburg presented new Colours to the 1st Bn. Hampshire Regiment at Portsmouth.

FOREIGN PERIODICALS.

NAVAL.

ARGENTINE REPUBLIC.—*Boletín del Centro Naval.* Buenos Aires: March-April, 1907.—"The Hague Congress." "Submarines." "Rations." "The Part taken by the Guns in Naval Battles." "The Maritime Canal from Buenos Aires to the Parana" (*concluded*). "The Integral Advantage of the Sea Fisheries." "The Mercantile Marine: Mercantile Recantation." "Oscillating Platform for Firing Practice in Polygons." "Arctic Explorations." "The Catastrophe of the "Iéna."

AUSTRIA-HUNGARY.—*Mittheilungen aus dem Gebiete des Seewesens.* No. 7. Pola: July, 1907.—"The Leading of a Fleet in Battle." "Knowledge and Skill in the Training of Naval Officers." "The German Naval Estimates for 1907." "Mishaps and Injuries on board French Warships." "The Salving of the Stranded Steamer "Suevic" of the White Star Line." "An Air-Heater for Torpedoes."

BRAZIL.—*Revista Maritima Brazileira.* Rio de Janeiro: February, 1907. — "The New Naval School Regulations." "Naval Surgery." "Guns" (*continued*). "Naval Manœuvres." "Firing Practice in the Navy." "The Coast of Brazil." "The Pilotage of our Harbours." "Marine Boilers."

March, 1907.—"The Problem of the Engineers." "The Port of "Amarraçao." "Guns" (*continued*). "Evolution and Tactics of Artillery and Landing Operations" (*continued*). "Naval Manœuvres" (*continued*). "Questions of Artillery." "Wireless Telegraphy and the Steering of Torpedoes." "The Coast of Brazil" (*continued*). "Dimensions of a Target for Artillery."

CHILI.—*Revista de Marina.* Valparaiso: January, 1907.—"The Ministry of War and Marine: The Convenience of Separating Them." "Some Remarks on Hydrography." "Naval Dockyards." "The Dog-fish and its Industrial Utility." "Submarine and Submergable Boats." "The Greasing and Lubrication of Engines." "The Peruvian Cruisers." "Reform of the Pay Regulations of the Fleet." "Strategy."

February, 1907.—"Organisation of the Fleet." "The Naval Policy of certain Powers." "The Hydrographical Service of the French Navy." "Naval Provisions." "National Transports." "Apparatus for Taking Impressions in the Bore of a Gun." "Strategy" (*continued*). "The French Fleet of the Future." "The Opposition of Mars." "National Dockyards."

March, 1907.—"Protection of the Mercantile Marine." "The Fleet Rations." "The Manning and Fitting of Training-Ships." "Naval Officers in Foreign Navies." "The Organisation of a Modern Fleet." "The Accident to the French Submarine "Algerien."" "The Greasing and Lubrication of Engines" (*continued*).

April, 1907.—"The Necessity for Establishing a Base of Operations in the North of the Republic." "Dockyards and Supplies." "Promotion in Foreign Navies." "Organisation of Coast Defence Abroad." "Coast Artillery in Germany." "The Pay Regulations and the Men of the Fleet." "The Stability of Nitro-Explosives in use in the Fleet." "The Greasing and Lubrication of Engines" (*continued*). "The Scientific Commission in Europe and the United States."

FRANCE.—*Revue Maritime.* Paris: May, 1907.—"The Errors and Misfortunes of a Navy" (*concluded*). "Statistics of Shipwrecks and other Accidents at Sea for the Year, 1905." "Installation of a Compass on board ship for Compensation Trials."

La Marine Française. Paris: June, 1907.—"Subaltern Officers." "The Port of Bordeaux and the Messageries Maritime Co." "On the Projectile to be Employed." "Some Reflections on Courts Martial." "The Civil *Personnel* of the Navy." "Some Powders and Explosives in the Navy."

Le Yacht. Paris: 1st June, 1907.—"The Recruiting of the Crews of the Fleet." "Yachting Notes." "A Contribution to the Studies of Automobile Torpedoes" (*concluded*). "The Launch of the First-class Battle-ship "Verité."" 8th June.—"*A Propos* of Wrecks." "Yachting Notes." "Vedette Motor Torpedo-boats." "The new U.S. Submarines." 15th June.—"Safety on board Submarines." "Yachting Notes." "The

International Maritime Exhibition at Bordeaux." "The Gunnery and Torpedo Schools." "Some Reflections on the Strike of the *Inscrits Maritimes*." 22nd June.—"The Naval Budget for 1908." "Yachting Notes." "The new Italian Battle-ship "Regina Elena."" 29th June.—"The French Cup." "Yachting Notes." "*A Propos* of the Naval Chief Warrant Officers." "The Entry Examinations to the Naval School."

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La Vie Maritime. Paris: 25th June, 1907.—"Seamen and Gunners." "Work (?) in the Toulon Dockyard." "Submarine Photography." "Our New Constructions: High Free-board Vessels, Battle-ships" (*concluded*). "The Lessons of the Last Strike of the *Incrits Maritimes*."

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SWITZERLAND.—*Revue Militaire Suisse.* Lausanne: June, 1907.—"Why Marshal Bernadotte did not Appear either at Jena, Anerstardt, or Eylau" (*concluded*). "Inconveniences of Long Recoil on Carriages for Field Howitzers." "The New Military Law." "Norwegian Skiers."

UNITED STATES.—*Army and Navy Life.* New York: June, 1907.—"The Naval Academy—Past and Present." "The Department of Discipline at the Naval Academy." "Rear Admiral Coghlan." "The United States Marine Corps School of Application." "At Jamestown Exposition." "The Necessity for Marksmanship." "The Boys of England." "Alvarado and Yaquis." "West Point Graduating Class, '07." "The Trouble with the Army."

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La Campagne de 1794 à l'Armée du Nord. Par le Colonel H. COUTANCEAU. Publié sous la Direction de la Section Historique de l'Etat-Major de l'Armée. Vol. I., Parts 1 and 2, and Vol. II. 8vo. (R. Chapelot et Cie). Paris, 1903-07.

Les Trophées de la France. By Le Commandant M. VERILLON. Royal 8vo. 24s. (J. Leroz.) Paris, 1907.

Central South African Railways: Report of the General Manager of Railways for the Year Ending 31st December, 1906. Fcap. folio. (Presented). Pretoria, 1907.

Die Zukunft der Kavallerie. 8vo. (Presented.) Vienna, 1907.

Submarine Navigation Past and Present. By ALAN H. BURGOYNE. 2 Vols. 8vo. 31s. 6d. (Grant Richards.) London, 1903.

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Exercier-Reglement für die Infanterie. 12mo. Berlin, 1906.

Organisation et Tactique des Trois Armes-Infanterie. Fasc 1. L'Infanterie au XVIIIe Siécle. Par le Comdt. J. COLIN. Publication de la Section Historique de l'Etat-Major de l'Armée. 8vo. 4s. 6d. (Berger-Levrault et Cie.) Paris, 1907.

Organisation et Tactique des Trois Armes—L'Artillerie au XVIII^e Siècle. Par le Commandant E. PICARD and Le Lieutenant L. YOUAN. Publication de la Section Historique de l'Etat-Major de l'Armée. 8vo. 2s. 3d. (Berger-Levrault et Cie.) Paris, 1906.

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La Campagn Maritime de 1805—Trafalgar. Par le Chef D'ESCADRON E. DESBRIÈRE. Public sous la Direction de la Section Historique de l'Etat Major de l'Armée. 8vo. (R. Chapelot et Cie.) Paris, 1907.

La Legion D'Honneur. 1802-1900. By E. BONNEVILLE DE MARSANGY. 2nd Edition. Royal 4to. 16s. (Lebrairie Renouard.) Paris, 1907.

Geschichte der Königlich Deutschen Legion, 1803-1816. By Captain B. SCHWERSFEGER. 2 vols. 8vo. 35s. Hanover, 1907.

Theorie der Rohrrücklaufgeschütze. By Professor F. RAUSENBERGER. 8vo. (Presented.) (A. Bath.) Berlin, 1907.

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After Worcester Fight. By ALLEN FEA. 8vo. (John Lane.) London, 1904.

Schiessvorschrift für die Feld Artillerie. Official. 12mo. Berlin, 1907.

Military Memoirs of a Confederate. By Brigadier-General E. P. ALEXANDER. 8vo. 16s. 8d. (Charles Scribner's Sons.) New York, 1907.

Nearest the Pole. By R. E. J. PEARY, U.S.N. 8vo. 21s. (Hutchinson & Co.) London, 1907.

RECENT PUBLICATIONS OF MILITARY INTEREST.

COMPILED BY THE GENERAL STAFF, WAR OFFICE.

JULY, 1907. PUBLISHED QUARTERLY.

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PREFATORY NOTE.

This Pamphlet will be issued quarterly, in April, July, October and January. Its purpose is to draw the attention of Officers to British and Foreign publications of Military interest which are likely to assist them in their professional work. Copies of the pamphlet will be distributed to the Headquarters of Commands, Educational Establishments, Units and Reference Libraries.

PART I.

NOTICES OF PRINCIPAL WORKS.

NOTE.—When the price is not given in Parts I and II, it is not known.

HISTORICAL.

The "Times" History of the War in South Africa. Vol. V. Edited by Erskine Childers. General Editor, L. S. Amery. With maps, plans and portraits. 614 pp. 8vo. London, 1907. Sampson Low, Marston & Co. 21/-.

This volume of the "Times" History takes up the story of the South African War from August, 1900, and ends with the signing of the Peace Treaty on 31st May, 1902. The headings of the Chapters are as follows:—

I. The Awakening in the Free State.
II. The Awakening in the Transvaal.
III. The Problem before Kitchener, December, 1900.
IV. Nooitgedacht and the Transvaal Outbreak, December, 1900-January, 1901.
V. The Invasion of Cape Colony and the Great De Wet Hunt, December, 1900-March, 1901.
VI. French in the Eastern Transvaal, January-April, 1901.
VII. The Middelburg Conference, February-March, 1901.
VIII. The Northern Advance and the Campaign against Viljoen, March-May, 1901.
IX. Close of the Summer Campaign. Western Transvaal, Free State, Cape Colony, February-May, 1901.
X. Kitchener and the Guerilla War, 1901.
XI. The Winter Campaign of 1901, May-September, 1901.
XII. Botha's Attempt to invade Natal, September-October, 1901.
XIII. Bakenlaagte, Moedwil and other Incidents of the Boer Spring Revival. September-October, 1901.
XIV. The Blockhouse System.
XV. De Wet's last Campaign, November, 1901-January, 1902.
XVI. Night raids in the Eastern Transvaal. November, 1901-March, 1902.
XVII. The New Model Drive, N.E. Free State, January-March, 1902.
XVIII. Yzer Spruit and Tweebosch, W. Transvaal, February-March, 1902.
XIX. The Final Struggle with De La Rey, W. Transvaal, March-April, 1902.
XX. The General Situation in April, 1902.
XXI. Peace, April 12th-March 31st, 1902.

As the General Editor remarks in his preface, "The new war, for such it really was, will always be of compelling interest. . . . "It was a guerilla campaign *in excelsis*, deliberately entered upon by the national authorities and deliberately adapted to the existing military organization of the Republics. . . . Nothing, indeed, could have illustrated more clearly than this compaign the enormous resisting power of a free democracy organized on a simple and comprehensive system of national military service."

There are portraits of British and Boer leaders and numerous clear maps and plans. The chief defect of the book is the want of an index.

Two Years on Trek. Being some account of the Royal Sussex Regiment in South Africa, by the late Lieut.-Colonel du Moulin, with a preface by Colonel J. G. Panton, C.M.G. Edited by Captain H. F. Bidder. 323 + xi. pp. 8vo. London, 1907. Murray & Co. 10/6.

This is a valuable contribution to the literature of the South African War. It was the original design of Colonel du Moulin to write a history of the doings of the Royal Sussex Regiment in South Africa, but the death of that officer prevented its completion, and the present volume has been edited by Captain Bidder, who has added some details regarding the conclusion of the campaign and the doings of the 3rd Battalion. It contains clear accounts of actions in which the Royal Sussex Regiment took part, among which were Zand River, Diamond Hill, and Retief's Nek. It is written from the point of view of the regimental officer, but contains a great deal of value to officers of all grades, and, although the author never mentions himself or his achievements, it can easily be seen that the book is the work of a gallant and able officer.

Appendices contain the stories of the 13th and 21st Mounted Infantry by Captain Hunt and Lieutenant Beeton.

Reports of Military Observers attached to the Armies in Manchuria during the Russo-Japanese War. Part iii. Report of Major Joseph E. Kuhn, Corps of Engineers. 235 pp., numerous maps, sketches and photographs. 8¼ by 5½ inches. Washington, 1906. Government Printing Office. 12/6.

Major Kuhn was with the Japanese Army in the field from July, 1904, to September, 1905, being first attached to the Second Japanese Army, and, from November, 1904, onwards, to the Third.

The report contains much valuable information, but unfortunately has no "contents." It deals first with the various arms and departments in succession. A strong

case is made out in favour of the provision of high-explosive shell for the field artillery. Japanese sanitation and hygiene are described in very different terms from those which irresponsible writers have employed with regard to them.

"As an item of interest, it may be mentioned that the casualties from horse management in the armies exceeded those due to the bayonet, a convincing testimony to the viciousness of the Japanese pony."

Field fortification does not receive all the attention one might expect, but some excellent drawings and photographs are given, and a short but interesting description will be found of obstacles constructed close to the enemy's trenches. This subject is closed with the remark: "As was to be expected, the material damage inflicted by artillery on field-works proved a negligible quantity, but some form of head cover was shown to be necessary to give protection and confidence to the troops when long exposed to shrapnel fire."

Nearly half of the book is devoted to Port Arthur. The author arrived there in time to witness the final scenes of the siege, and remained after the surrender for two months in order to inspect the works. An excellent little history of the siege is given in a condensed form, and is followed by a detailed description of the Russian works, including the coast defences. It is well illustrated by maps, drawings and photographs. Some description follows of the special methods of warfare employed in the siege, such as the use of hand-grenades, siege artillery and mining, but the Japanese siege-works are not very fully dealt with. The losses on the Japanese side during the siege are placed at about 56,500, exclusive of sick.

Major Kuhn also describes the closing scenes of the battle of Mukden, which he witnessed.

The volume closes with some general conclusions to be drawn from the war. The slowness of the movements of the Japanese Army is noticed, and its transport arrangements unfavourably compared with those of the Russians. The value of Port Arthur as a factor in the war is pointed out. A few lines are devoted to infantry formations and ammunition supply; the use of machine guns is advocated. The report concludes with words of praise for the Japanese soldier and his officers.

Six Months with the Japanese Field Army (Sechs Monate beim Japanischen Feldheer). By Major Bronsart von Schellendorf. 329 pp. 146 photogravures and 2 maps. 10 by 6½ inches. Berlin, 1906. Mittler. 8/-.

The author, the son of the Chief of the Operations Section of Von Moltke's Staff in 1870-1, accompanied Prince Charles of Hohenzollern to Manchuria. Leaving Europe in August, 1904, they reached the seat of war just after the battle of the Sha Ho and were attached to the Fourth Japanese Army (with which there was no British representative).

In January, 1905, they paid a visit to Port Arthur, returning just in time for the battle of Mukden.

The earlier part of the book is the record of a military visitor in the theatre of war, but fortunately for himself and his readers, Major Bronsart was permitted by his hosts to go whither he listed during the battle of Mukden, and his account of what he saw is of the greatest military interest.

The following is extracted from his account of an infantry fight: "I saw nowhere sealed pattern formations. Each company, each battalion fought as the situation demanded, with reference to neighbouring units and making the fullest use of the ground. If there was plenty of cover, *e.g.*, villages, copses and depressions, whole lines, with the front of a battalion, marched forwards simultaneously in step. If there was lack of cover, or if Chinese graves, clumps of trees, and single houses offered only limited protection, the advance was made in small groups and in short quick rushes. The same unit used every imaginable formation, one after the other, in order to advance a few hundred yards. The only thing I did not see was crawling for long distances."

"Every small fold in the ground, every furrow was used, no matter how small; the men sank into the ground and vanished in the apparently cover-lacking plain. They scraped little sand-heaps together with their hands, to get cover from view and a rest for their rifles. I did not notice that they made use of their spades to dig themselves in. There was neither time nor possibility to do so (note by reviewer: the ground was hard frozen). . . . the main thing was to shoot, to shoot often, but to shoot well."

"There were the greatest calm and attention in the firing line. The men worked by signals, without words of command."

"The impulse for a further advance was given by the officers; when there were no officers, one or two of the rank and file rushed forward and carried those nearest with them. Thus the long firing line, in smaller or larger groups, and with shorter or longer rushes according to the situation, got to within 400 yards of the Russian position, and it became evident that the enemy was wavering. Individuals and large crowds were seen running back and disappearing; then a number of Japanese rushed forward, every one followed them, and the whole distance to the Russian position was passed over in one rush. There was no bayonet fighting; the few Russians remaining behind in the houses surrendered."

The numerous photographs are exceedingly clearly reproduced, and add very much to the value of the book.

Military Historical Monographs: The Russo-Japanese War, 1904-5. (2) The Ya-lu. (Kriegsgeschichtliche-Einzelschriften. Aus dem russisch-japanischen Krieg 1904 bis 1905. (2) Ya-lu.). Issued by the German General Staff. 144 pp., 7 appendices, 6 maps and 5 photographs. 10 by 6½ inches. Berlin, 1907. Mittler. 4/9.

This is the second publication on the Manchurian War which has been issued by the Modern History Section of the Great General Staff, the first having been entitled

"Port Arthur." Although it is modestly called "The Ya-lu," it practically forms the first part of a condensed history of the war, Section 1 containing an account of events leading to the war, Section 2 a careful description of the theatre of war, Section 3 a survey of the opposing forces, and the remaining three Sections an account of the operations by land and sea up to and including the action of the Ya-lu (the word *Treffen*, action, is used in describing it and not *Schlacht*, battle).

The relation of the events is in general accord with the account given in "Russo-Japanese War, Part I," published by the British General Staff, except as regards the fighting near Ha-ma-tang. There, far from being surrounded and forced to surrender, it would appear that the 3rd Battalion of the 11th Rifle Brigade, headed by its commander and priest, with its band playing, and followed by fragments from other corps, cut its way through the Japanese, leaving behind practically only wounded men and disabled guns. A special comment is made upon this incident to the effect that "even with modern weapons, stout-hearted troops may find a way out of an apparently desperate situation."

The Great General Staff is of opinion that as landings were only possible at a limited number of places in Manchuria, the Russians were in a position "to disturb them (the landings) seriously and so to gain time, even if they were unable to prevent them in the end." The Russian view, however, seems to have been that it was better to let the Japanese land unhindered, to attack them with numerical superiority, and end the war in one great battle. A principle laid down by Von Moltke is, however, quoted: "In opposing a landing, all depends on being first on the spot." "It is all very well to adhere to a definite plan, but this course need not involve refusing such momentary advantages as may offer themselves."

Japan is judged to have over-estimated the initiative of Russia and to have expected to meet a stronger resistance in Korea than was actually encountered; this is possibly accounted for by the fact that Korea had been the subject of diplomatic conflict and might be supposed therefore to possess a high value in the eyes of Russia, apart from its being the safest line of communication for the Japanese. That Japan, meeting with no serious opposition in Korea, did not land more than the troops of her First Army in that country, is a proof that she correctly adapted her plans to the new situation.

The volume concludes with general comments of the operations described.

The Russo-Japanese War: Lectures given at the Russian Staff College (Русско-японская война въ сообщеніяхъ Николаевской Академіи Генеральнаго Штаба). First part edited by Colonel Baiov, of the General Staff, Professor at the Staff College. 396 pp. 13 maps, 10 in. by 6 in. St. Petersburg. 1906. C. G. Knorus. Also translated into French as Conférences sur la guerre Russo-Japonaise faites à l'Académie d'État-Major Nicolas. (Fascicules 1er et 2e.) 158 and 101 pp. 6 maps. 9 by 5½ inches. Paris, 1907. Henri Charles Lavauzelle. 5/- (for the two parts).

These lectures deal with the origin and commencement of the war; the actions of the Ya-lu and Te-li-ssu; the operations in the mountains of Southern Manchuria in the summer of 1904; the action of Ta-shih-chiao; the battle of Liao-yang; and the battle of the Sha Ho. The French translation stops short of the battle of the Sha Ho.

The lectures themselves, given by Staff College professors who do not appear to have been present in the actions with which they deal, are of varying military value. The importance of the publication is due to the appendices, which contain official reports and also criticisms, made at the lectures, or afterwards in the Press, by officers who were on the Russian Staff in the field. Among these are the reports of the colonels of the 12th and 22nd East Siberian Rifle Regiments at the Ya-lu, from which it would appear that the turning movement of the 12th Japanese Division was too slow and produced no effect, and that the retirement of the Russians was due to the frontal attack.

There are also the observations of General Stakelberg and his Chief of the Staff, Major-General Gurko, on the battle of Te-li-ssu, and of Lieut.-General Yilinski, Chief of the Staff to the Viceroy Admiral Alexiev, on the general plan of campaign, and the official reports of the army corps commanders on the action of Ta-shih-chiao.

Experiences and Reminiscences of the Russo-Japanese War (Erlebnisse und Erinnerungen aus dem Russisch-Japanischen Kriege). By Friedrich von Nottbeck. 250 pp. 7½ by 5 inches. Berlin. 1906. Curt Wigand. 3/-.

The author, a landowner in the Baltic Provinces, and a reserve second lieutenant, volunteered for service at the commencement of the war, but was not called up until July, 1904, when he was appointed to the staff of the 22nd Infantry Division (First Army Corps). On reporting himself, he found the vacancy had been filled up, and at his own request was detailed to the 86th (Vilmanstrand) Infantry Regiment.

He does not attempt to describe even the general outline of the course of the war, but confines himself to his own personal experiences, and being a keen observer, and evidently a sympathetic personality, the result is an interesting picture of the Russian Army from within in war time.

He joined his regiment, which had not yet been engaged, in time for the battle of the Sha Ho, being wounded at the close of the fighting in the recapture of Putilov Hill. His experiences of Russian hospital trains and establishments, lead him to say that they were unlike those he saw depicted in the illustrated papers. On his recovery he refused four months' leave to Russia, which was offered him, and rejoined his regiment in time for the battle of Hei-kou-tai (Grippenberg's unsupported offensive); but the regiment waited in vain for orders to join in the attack. At the battle of Mukden, he was opposed to the Japanese of the Fourth Army under General Nodzu.

Although written with an endeavour to make the best of things, and in a spirit of admiration of the Russian soldier, the author occasionally makes observations which afford a clue to the ill-success of the Russian arms.

With regard to General Kuropatkin, he says that army opinion was divided: "There were people who raved about him, and raised him to the skies, and others who were hostile to him, and tore him down."

He states that the troops were not sufficiently informed as to the purpose of the enterprises which they were ordered to carry out. It was only after he was wounded, and in hospital, that he learnt of the importance of the attack on Putilov Hill; his regiment had merely been ordered to drive off the Japanese who were holding it.

A very dangerous atmosphere of suspicion appears to have permeated the Russian Army: everyone personally unknown to the soldiers was suspected of being a Japanese. "It was useless," he says, "to repeat the Lord's Prayer; to enumerate the names of the Russian generals and well-known officers, the soldiers merely replied, 'That's enough, that's enough! the Japanese know everything.'" Many officers were thus killed by their own men; one officer of the 86th escaped with only a severe bayonet wound by suggesting that as he was an officer he had better be taken alive; his captors then led him, bound, to headquarters.

In Lieutenant von Nottbeck's opinion, far too many reservists were sent to the front instead of the younger men, who were retained in garrison in Russia. He noticed the uneasiness of the older men under fire, and remarks, "No wonder, as many had a wife and children at home." He saw an officer of the Viborg Infantry Regiment driving men to the front with his sword.

It was perfectly hopeless to try and make the men "run forward singly, with large intervals between them; they stuck close to one another, like a herd of sheep, each seeking the protection of the other. No shouting and no orders could prevent this."

The Engineers in the Russo-Japanese War. Part I. Operations of the technical troops in the field warfare, excluding field fortification. Publications of the Prussian Engineer Committee. (Mitteilungen des Ingenieur Komites. Pionierwesen im Russich-Japanischen Kriege, 1904-5. I Teil. Tätigkeit der technischen Truppen im Feldkriege ausschl. Feldbefestigung.) Issued by the Prussian Engineer Committee. 99 pp. Sketches in text and one plate of diagrams. 9 by 6 inches. Berlin, 1907. A. Bath. 2/6.

It is announced in the preface that a second part, dealing with field fortification and the attack and defence of fortified positions, will shortly be issued; the present part is devoted to the organization of the technical troops, the equipment of the two armies with entrenching tools, bridging, roads, hutting, railways, telegraphs and telephones, balloons, mounted engineers, searchlights, observatories, and power wagons.

The Siege and Surrender of Port Arthur. Personal Impressions. (Осада и сдача крѣпости Портъ-Артуръ.) By Major-General M. E. Kostyenko. 276 pp. 8vo. Kiev, 1906. Bankovaya Ul. No. 11. 3/8.

The author disclaims any attempt to furnish a complete or detailed history of the siege, and confines himself to such personal observations as may assist in throwing light on the real causes of Russia's failure in the war.

The style is chatty, but descriptive, and many trivial incidents are introduced with the object of throwing sidelights on the general situation. Considerable space is devoted to describing the demoralized state of social and military life at Vladivostok and Port Arthur both before the war and after the outbreak of hostilities.

The conduct and character of General Stössel are severely criticized; General Kondratenko, on the other hand, is eulogized as a typical patriot and leader of men.

The rank and file who defended Port Arthur are warmly praised for their bravery, tenacity and patience under severe hardships. In conclusion, the author attributes Russia's defeat in Manchuria not to any defective qualities in the *morale* of the troops, but to want of previous preparation on the part of the authorities. The Russian Government spent large sums of public money on Dalni and the railways in the Far East, but grudged the necessary funds for the adequate protection of Port Arthur. The army at the outbreak of the war was in a lamentable state of unpreparedness as regards organization, training, armament and equipment, and the fleet suffered as much from obsolete *matériel* as from a total lack of experienced commanders.

Raid on Ying-kou. (Набѣгъ на Инкоу.) By Colonel Svyeshnikov. 123 pp. 2 sketch maps. 4to. St. Petersburg, 1906. V. A. Berezovskavo, Kolokolnaya Ulitsa, No. 14. 2/1.

The author describes the raid made on Ying-kou, 1st-15th January, 1905, by General Mishchenko's force of Cossacks and other mounted troops, formed into four columns under Generals Teletev, Abramov, Samson and Colonel Svyeshnikov (author).

The operation orders are given, and criticisms made on the manner in which they were carried out.

The author considers that the attacks made on Niu-chia-tun and Niu-chuang were unnecessary, only tending to delay the advance, and that the raid lacked the essentials of success, viz., secrecy, care in preparation, and celerity in execution.

The slow rate of marching, 20 miles a day, he attributes partly to unnecessary halts and partly to excessive transport; the latter consisted of 1,500 pack horses; and a large quantity of the supplies carried were afterwards thrown away.

The force was practically unprovided with maps, and the few which were available were inaccurate.

From Jena to Eylau. (Von Jena bis Pr. Eylau.) By General Baron von der Goltz. 202 pp. With four maps. 8vo. Berlin, 1907. Mittler. 5/6, or bound, 7/

This book is a continuation of the Author's previous work, "From Rossbach to Jena and Auerstadt," in which he records the military events of forty-nine years, including Frederick the Great's successes in the Seven Years' War. The present volume tells a different tale, for it deals with the seventeen weeks of Prussia's greatest humiliation, when she lay prostrate at Napoleon's feet. On these pages of history there stand out pre-eminently two great men, Blücher and Scharnhorst, and the book naturally divides itself into two parts dealing with the fortunes of each. In the first we follow Blücher in his masterly retreat northwards to his final surrender at Ratkau, a tale which has lately been told in great detail by Major-General von Unger. In the second the author traces the events upon the Vistula and Alle, and shows clearly what a difficult position Scharnhorst held as a subordinate to L'Estocq, who was a veteran of the Seven Years' War, and himself under the orders of the Russian Commander-in-Chief Bennigsen, whose interesting Memoirs dealing with this period have just been published by Captain Casalas, of the French Army.

The author concludes a most able and instructive book with a detailed account of the battle of Eylau, fought on the 7th and 8th February, 1807, and which he calls "The Vindication." In this we venture to think that General von der Goltz has allowed his patriotism to over-ride his true judgment of historical perspective in a manner hardly justified by fact. It must be remembered that Eylau was a distinctly indecisive battle, and that the withdrawal of the Allies under cover of darkness adds little strength to their claim to have won a victory. Again, the bulk of the Allied Forces were Russians, whose strength is variously given from 58,000 to 83,000 men, while L'Estocq, whose rearguard had been slightly engaged with the VIth French Corps under Ney, and who only came into action late in the day on the Russian left against Davout, had no more than 6,000 Prussians.

This book should rank as a military classic.

The Wars of the Liberation (Die Befreiungskriege) 1813-1815. A strategic survey. By Lieut.-General von Caemmerer. 143 pp. 8vo. Berlin, 1907. Mittler. 4/6.

The student of military and political history is often too apt to fall into the error of studying his subjects in compartments, and of taking note of events without making enquiry as to their causes. This is especially the case in studying military history where attention is often directed to one campaign or to the campaigns of one nation. For instance, in referring to Napoleon's campaigns, we are apt to think of his Italian campaign, his Austrian and Prussian campaigns, his retreat from Moscow, etc., as isolated events, and to forget that all these are merely successive steps in historical development. A careful perusal of General Caemmerer's account of what were probably the most interesting two and a half years of European military history, will serve as an antidote to the error above mentioned. The Treaty of Tilsit (7th July, 1807) was a turning point in Napoleon's career. The failure of his campaign against Russia in 1812, led Frederick William of Prussia to declare war against France on the 16th March, 1813. Exactly seven months later, at the hands of the allied Russians, Prussians, Austrians, and Swedes, Napoleon received his crushing defeat at Leipzig, which enabled the allies to push on to Paris and force his abdication The book is in four parts, the last of which deals with the 1815 campaign and concludes with the day of reckoning on the 18th of June. The description of the tactical events of the campaigns has often been given in greater detail, but the value of this book rests upon its strategic comments and references to political causes, which, though perhaps in some instances open to question, show at any rate that the author is a man who can take that broad view of events which is necessary for the military student of history.

The book would be improved by the addition of good maps.

Napoleon's Conquest of Prussia, 1806. By F. Loraine Petre, with an Introduction by Field Marshal Earl Roberts, V.C., K.G. 311 pp. 7 maps and battle plans, numerous portraits and other illustrations. 8vo. London, 1907. John Lane. 12/6 net.

The author divides Napoleon's campaign of 1806 into two periods. The first period deals with the origin of the war, the armies of the contending Powers, plans of campaign, movements of both armies up to the 10th October, action of Saalfeld, operations from the 10th to the 13th October, battles of Jena and Auerstadt, and the strategy and tactics of the first period of the war. The second period embraces the action of Halle and the occupation of Berlin, the pursuit of Hohenlohe and his capitulation at Prenzlau, Blücher's march to Lubeck and surrender at Ratkau, the fate of Magdeburg, Hesse, Cassel and Hameln, and concludes with some useful remarks upon the course of the war during this period.

In the Introduction, Lord Roberts observes: "One cannot read the story of the Jena campaign, as told by Mr. Petrie, without realizing from the tragedy of Prussia in 1806, as depicted therein, a tragedy without parallel in modern times, the fate, amazing in its swiftness and appalling in its severity, which may at any moment overtake a State which exists in fancied security, based on traditions of a heroic past, and wrapped in a selfish indifference, hoping, ostrich-like, to escape the danger it refuses to see."

Napoleonic War (La Guerre Napoléonienne). By Lieutenant Colonel Camon. 372 pp. Numerous sketch maps. 8vo. Paris. 1907. Chapelot & Co. 5/6.

In former works the author has given a summary of Napoleon's chief campaigns and has sketched the theory of the Napoleonic battle. He now proceeds a step

further, and by an inductive study of Napoleon's systems of operations, undertakes to establish the theory of the Napoleonic war. With all the ambition of the pioneer, Colonel Camon perhaps treats somewhat too slightingly the opinions of such writers as Gouvion-St. Cyr, Marmont and Clausewitz. In the present volume the author limits himself to a general analysis of the systems of operations, and promises to give later an examination of the moral and material means which Napoleon employed for the fulfilment of his object.

Military Memoirs of Joseph Grabovsky (Mémoires Militaires de Joseph Grabowski). Edited by M. W. Gasiorovsky, and published in Warsaw in 1903. Translated from the Polish by Mm. Jan V. Chelminski and Major A. Malibran. 311 pp. Crown 8vo. Paris 1907. Plon-Nourrit et Cie, 8 Rue Garancière. 3/-.

At the age of 21 Grabovsky entered the Polish Army, just in time to take part in Napoleon's Russian campaign. During the retreat from Moscow his knowledge of the language of the country gained him a place on Napoleon's staff, and he remained in personal attendance on the Emperor through all the scenes of the Napoleonic tragedy up to the final act of the drama at Fontainebleau on the 20th April, 1814. His devotion to the Emperor was remarkable, and though he shared with his countrymen the expectation that Napoleon was about to re-establish the Polish Kingdom, the non-realisation of his hope never shook his fidelity to his master. Grabovsky lived till 1880, and penned these memoirs nearly thirty years after the death of Napoleon. Though the pages have thus the advantage given by the moderation of true historical perspective, they have lost none of the charm and freshness of a journalism contemporary with the events which they describe. The horrors of the retreat from Moscow, the battles of Dresden and Leipsig, where the Poles lost heavily, the withdrawal on Paris, the abdication at Fontainebleau, are all described with a truthfulness as regards facts, and an absence of self-laudatory commentary which too seldom adorn the ordinary autobiography. This is altogether an admirable book.

From Königgrätz to the Danube. (Von Königgrätz bis an die Donau.) An account of the operations in the Austro-Prussian Campaign of 1866, after the battle of Königgrätz. By an officer of the Austrian General Staff. 8vo. Vienna. L. H. Seidel. 16/-.

Vol. I. The Retreat of the Northern Army from the Battlefield of July 3rd. With maps. 188 pp.
Vol. II. Prince Holstein's Cavalry Corps, and the Advance of the Prussian Main Body towards Vienna. With maps. 206 pp.
Vol. III. The defence of the Danube. With maps. 159 pp.

Two volumes have been previously published, namely, "The Critical Days of Olmütz in July, 1866," from July 9th to the evening of July 15th, which appeared in 1903; and "The Final Operations of the Northern Army," 1866, from July 15th, until the cessation of hostilities. The five volumes are now united under the general title given above.

In its broader historical and political aspect, the 1866 campaign ends with the battle of Königgrätz on July 3rd, but to the more detailed inquiries of the student of military history, the period between July 3rd and 22nd gives perhaps even more interesting and instructive replies than that which preceded the decisive engagement.

Had Benedek been able to select the line of his retreat he would undoubtedly have retired direct towards Vienna, which lies some 140 miles almost due south of Königgrätz. In this case, however, as in so many others, strategic movements were determined by tactical causes, and the direction of the retreat was prescribed on the field of battle. Benedek retreated with his broken forces to reform under the guns of Olmütz, which lies 80 miles N.N.E. of Vienna, leaving the road open to the Prussians for a direct move upon Vienna.

On the 5th the Prussians crossed the Elbe without opposition, and regaining touch with the enemy on the 8th about Zwittau, the Second Army, under the Crown Prince, moved in the direction of Olmütz, while the First Army under Prince Frederick Charles took a more direct route towards Vienna.

Those interested in the question of the efficacy of cavalry to delay a determined advance by the enemy will find much useful information in Volume II, in which the advance of the Prussians to Brünn, and the driving of the Austrian cavalry across the Danube are discussed in detail.

What we might call "The Last Phase" is dealt with in Volume III. The desperate attempts of the Austrians to gain time in which to bring troops from Olmütz; and their refusal to surrender until the Prussians were within 35 miles of Vienna cannot but excite our admiration.

The author has had access to the military records of both the Powers engaged, and states his facts clearly and chronologically. His conclusions are sound, deliberate, and for the most part impartial. The result of his labours is a book which is of the highest interest to the military student, and which is probably the last word that can be written on a period of the campaign to which too little study has been devoted. The general maps, and the maps showing the position of troops from day to day, are particularly good.

Before Sadowa (Vers Sadowa). A Strategical Study, by Major Jules Duval. 309 pp. 2 maps. 8vo. Paris, 1907. Berger-Levrault et Cie. 6/-.

A carefully reasoned survey of the strategical situation up to the 2nd July, 1866. The book is divided into nine parts: the first part consists of a sketch of the

characters of Benedek, Prince Frederick Charles, the Crown Prince and some of their staff officers; the second part deals with Moltke, his character and career, and the remaining parts are devoted to the strategic movements of the campaign. The central figure of the narrative is Helmuth von Moltke. Major Duval, while duly appreciating the determination and the genius for organization which the great Field Marshal undoubtedly possessed, shows how his lack of imagination and resource makes his generalship inferior to that of such men as Gustavus Adolphus, Turenne, Condé, Prince Eugène, Villars, or Robert Lee, and how his lack of personal magnetism makes him, as a leader of men, take a far lower place in history than generals like Marlborough or Napoleon. The author strongly criticizes the great and, as it seems, almost unnecessary dispersion of the Prussian forces, and attributes their fortuitous junction on the battlefield of Sadowa to the incapacity of Benedek and his failure to seize the opportunity of acting on interior lines, first crushing the Crown Prince and then turning against the First Prussian Army under Prince Frederick Charles.

The Life of Wellington. The Restoration of the Martial Power of Great Britain. By the Rt. Hon. Sir Herbert Maxwell, Bart. 6th Edition. 793 pp., with maps, battle plans and photogravures. 8vo. London, 1907. Sampson Low, Marston & Co. 18/ net.

In the Preface to the sixth (one-volume) edition, Sir Herbert Maxwell explains that "the edition now presented, therefore, differs only from the others in appearing between one pair of boards instead of two pairs, and in being offered at a price which, it is hoped, may bring it within the reach of all who desire a compendious history of events which gave the map of Europe its present general arrangement, and of the man who exercised a dominant influence upon these events." As this valuable work appeared first, some eight years ago, and is therefore well known to most students of military history, it is unnecessary to indicate its contents. It is a book which should find a place in every military library, and be read by every officer in the service.

Hindustan under Free Lances, 1770-1820. Sketches of military adventure in Hindustan during the period immediately preceding British occupation. By H. G. Keene, C.I.E. With a preface by the Rt. Hon. Sir R. Temple, Bart. With illustrations and a map. 207 + 32 pp. 8vo. London, 1907. Brown Langham.

The title of this book is sufficiently indicative of its contents. It gives the history of Perron, de Boigne, Skinner, Gardner, Thomas, Law, "Sombre," and others who were prominent in the many wars and skirmishes of that time, besides presenting a good picture of the lawless condition of India in the period of which it treats. A sketch of the campaign against the Gurkhas under Ochterlony in 1815, is also given. To anyone interested in the history of India in the time of Lords Wellesley, Minto and Hastings, it should prove instructive, and a good deal of information can be deduced from it, regarding the training and leading of native troops.

British Malaya. By Sir Frank Swettenham, K.C.M.G. 345 pp. Illustrations and maps. 8vo. London, 1907. John Lane. 16/-.

The main idea of this book is to set forth accurately the important facts which led to the intervention of Great Britain in the domestic affairs of the countries now known as the Federated Malay States. The circumstances under which the experiment was made, the conditions which prevailed, the features of the country and character of the people are graphically described, while the gradual evolution of a system of administration without parallel in British annals is well worthy of attention. A comparison is drawn between the progress made in the Malay States under British protection and the other States of the Peninsula. The book is admirably written, and is interesting throughout to all students of British administrative methods.

Italian Sailors and Soldiers in Crete. (Marinai e Soldati d'Italia a Creta). By G. B. Casa, of the Italian Naval Reserve. 544 p.p. Illustrated. 8vo. Leghorn, 1906. Raffaello Giusti. 8/-.

An interesting work, in three parts, on Crete and the Cretan question. The first part deals with the movements of the Italian fleet up to the outbreak of the insurrection in 1897. The second part contains an account of the history of the island from mythological times up to 1896, showing its commercial and political development during four centuries of Venetian rule, and dealing with the various political and religious outbreaks in the island, since it passed under the rule of the Crescent at the close of the seventeenth century. The third part deals with the insurrection of 1897, and closes with the installation of Prince George of Greece as High Commissioner in December, 1898.

The addition of a fourth part, bringing the work up-to-date, and dealing with the outbreak of 1905-6, would greatly increase its value.

Bulgaria yesterday and to-day. (La Bulgarie d'hier et de demain.) By L. de Launay. 485 pages, with 26 illustrations reproduced from photographs taken by the author. 8vo. Paris, 1907. Hachette, 79, Boulevard Saint-Germain. 4 francs.

History of Bulgaria up to the present. The awakening of Bulgaria and the last Russo-Turkish War. Physical formation of the country; the Danube towns and the plateau of Plevna-Tirnovo. The line Rustchuk-Varna and the Deli-Orman district. The Bulgarian Dobruja district and the Black Sea Coast. The Balkans. The central depression; Sofia; Philippopolis. The Rhodope Range and district, and Macedonia. People; government; agriculture; commerce; industry; mineral wealth; financial situation; communications; army; the future.

POLITICAL.

Universal Peace or Universal War! What is Germany's proper course? (Weltfrieden oder Weltkrieg. Wohin geht Deutschlands Weg?) Political and military reflections on the eve of the Peace Conference at the Hague. By Count E. Reventlow. 152 pp. Crown 8vo. Berlin, 1907. Karl Curtius. 1/-.

An interesting book written by an able exponent of extreme Anglophobia. The author states that his object is to show that now more than ever has Germany need of a strong navy and a strong army. With this object in view he proceeds to examine and discuss the general political situation and its bearing upon various parts of Europe and Asia, including Singapore, Indo-China, the Philippines and Kiso-Chau. He also enters into an intelligent discussion upon the Far East after the war, the French Navy, the weakness of the Triple Alliance, etc., and from all these he draws the same general conclusion that "as the German Empire was formed by the sword, so by the sword must it be maintained" (page 39), and he calls upon the German people to look to the joints of their harness. If every assertion made by the author is carefully weighed, the book presents a sufficiently comprehensive survey of the present situation, though the allusions to past events are not always of equal value. It is, for instance, difficult to discover the applicability of the comparison of the treatment of Germany by Europe to that meted out to Carthage by Rome after the second Punic War (pages 117 and 143). The author thinks that the eve of the Peace Conference at the Hague is a fitting moment at which to state the reasons which influence Germany in her desire to increase her offensive and defensive strength. The author may be credited with a firm grasp of detail coupled with an extensive view of general tendencies, the perspective of which, however, is not invariably accurate. He has also a lively imagination.

The Unveiled East. By F. A. McKenzie. 347 pp., illustrated. 3 maps. 8vo. London, 1907. Hutchinson & Co. 12/-.

An interesting description of the situation in the Far East at the commencement of the present year. The author, who was a newspaper correspondent during the war in Manchuria, is distinctly hostile to the Anglo-Japanese Alliance, and accuses Japan of having entered on a campaign of aggressive Imperialism. He quotes with favour the opinion of the late Sir Henry Maine that any European Power which allied itself in arms with the Yellow races against another European nation would play traitor to the welfare of the whole human race. The way in which the Japanese are pushing their commercial interests, developing their mercantile marine, and finding outlets for their surplus population is described, and special attention is devoted to recent events in Korea.

The awakening of China is also dealt with, and the author asks whether the coming of the Chinese will be for weal or woe. In his opinion the great question of the future is whether China is to remain free and undivided, or whether a large portion of its territory is to pass under the control of Japan. He thinks that England should give the answer. There is an interesting account of the new Chinese Army. Altogether the volume is well worth reading, though the author's conclusions need not always be accepted.

The railway map of China, opposite p. 245, shows several lines as already constructed, which have not even been begun.

The Truce in the East and its aftermath. By B. L. Putnam Weale. 647 pp. 27 illustrations and 2 maps. 8vo. London, 1907. MacMillan. 12/6.

This book is of considerable interest, and forms a sequel to a former volume by the same writer: "The Re-shaping of the Far East."

Mr. Weale, who writes under a nom de guerre, was formerly, it is believed, in the Imperial Chinese Maritime Customs, and has been for many years in the Far East. He was in China during the Boxer Campaign of 1900 and the late Russo-Japanese War, and is undoubtedly an authority on China.

The book is divided into three parts.

Part I, headed "Japan and the New Position," deals with Japanese internal and external politics, and discusses the reasons why Japan made peace in 1905. Mr. Weale maintains that the peace in the Far East is only a truce, and that when the Anglo-Japanese alliance reaches its termination the Far Eastern question will still have to be solved, and that the solution rests with China, and China alone.

The surrender of Port Arthur is again touched on, and some excellent photographs depict the various forts.

Part II is devoted to "China and the Chinese," and the cry "China for the Chinese" is discussed from a twofold aspect, viz., the Government movement and the popular movement.

The immediate future of China would appear to depend upon the question of the succession to the throne, and Mr. Weale, like all other writers on Eastern politics, fails to throw any light on that complicated problem.

Part III discusses the various Powers, and their influence in the Pacific.

Mr. Weale is not an advocate of the Anglo-Japanese Alliance of 1905, and he considers that Japan gets the best of the bargain.

A future *rapprochement* between Russia and China against Japan is also hinted at.

The last 200 pages of the volume are devoted to Appendices containing the various treaties contracted during the last two years between Great Britain, China, Japan, and Korea, and other statistics of international interest.

The volume has also a good index.

MEDICAL.

Army Medical Studies during the Russo-Japanese War. (Studien auf dem Gebiete des Kriegs—Sanitätswesens im Russisch-Japanischen Kriege, 1904-1905). By Dr. Walter v. Oettingen. 247 pp., with 50 illustrations in the text. 4to. Berlin, 1907. Hirschwald.

The author was chief surgeon of a Voluntary Red Cross field hospital, which left Riga in April, 1904, for the Far East. He opened a hospital of 300 beds at Kho, a small village halfway between Harbin and Vladivostok; and afterwards went to Mukden, where he was asked to organize a Red Cross Section of the Evacuation Station there in November, 1904. The hospital was left behind in Mukden and fell into the hands of the Japanese on the 10th March, 1905. The book contains an account of the Russian medical organization, with details of field hospital construction, warming, equipment, etc., and numerous notes connected with the medical and surgical experiences of the battle of Mukden

The distribution of Venereal Disease in European Armies and amongst young men liable to military service in Germany. (Beiträge zur Kenntniss der Verbreitung der Venerischen Krankheiten in den Europäischen Heeren, so wie in der militär pflichtigen Jugend Deutschlands). Number 36 of the publications of the Medical Department of the Prussian War Office. 99 pp., with 12 maps and 8 charts. 4to. Berlin, 1907. Hirschwald. 4/11.

This is a work of geographical and political as well as of military interest. There are numerous statistical tables, showing the extent of various forms of venereal disease in European Armies since 1864 onwards, and their distribution in the several military districts of each country. The tables, maps and graphic charts are valuable for purposes of reference.

NAVAL.

The Art of Naval Warfare. Introductory Observations by Admiral Sir C. Bridge, G.C.B. 249 pp. 8vo. London, 1907. Smith Elder. 3/6.

This book, as its title will show, is primarily of interest to naval officers. Its main object, in the words of the author, is "to show the value—indeed the necessity—of a knowledge of naval history, which it is held ought to be studied not as a mere gratification of antiquarian predilection, but as a record of the lessons of naval warfare." Sir C. Bridge further describes his book as an attempt to supply the necessary introduction to the study of naval warfare. Although mainly on naval subjects, this book will be found interesting to all military officers who take interest in, or have made a study of, problems relative to the command of the sea and to the invasion and defence of these islands. Some remarks on the co-operation of the two services are made in a chapter entitled "Joint Expeditions," and a few observations on coast defence are included in another chapter.

The Naval Annual, 1907. By T. A. Brassey, A.I.N.A. 413 pp. With numerous plates and diagrams. 9¼ by 6 inches. Portsmouth, 1907. J. Griffin. 10/6.

This edition of a well-known annual publication consists of three parts.

Part I contains a review of the last year's work in British and Foreign Navies with comparative strength and tables; chapters on British Shipbuilding programmes, on the British, French, and Italian Naval Manœuvres of 1906, on the strategical features of the North Sea, and the reorganisation of the Navy, on the laws of the Navy, on the Blue Water School, and notes on Naval Policy.

Part II contains lists of British and Foreign ships with plans and ordnance tables.

Part III contains the First Lord's Explanatory Statement to the Navy Estimates, the Navy Estimates, programme of shipbuilding, naval works, and returns of gunnery and gunnery practices; the Navy Estimates of Austria-Hungary, France, Germany, Italy, Russia, and the United States; comparative naval expenditure; President Roosevelt's letter to Congress, enclosing a report of Lieut.-Commander Sims, U.S.N., on the tactical qualities of the "Dreadnought" type of battleship; and Mr. Shaw-Lefevre's Review of the Naval Annual, 1906.

There are illustrations of H.M.S. "Dreadnought," the French battleship "République," the United States battleship "Rhode Island" and armoured cruiser "Pennsylvania," and the German battleship "Deutschland."

There is also a diagram showing the expenditure of Great Britain on the construction of warships from 1875 to 1907-8.

BOOKS OF REFERENCE.

Dictionary of Military Terms: English-Japanese and Japanese-English. By Captain E. F. Calthrop, Royal Field Artillery; assisted by Captain T. Okubo, Captain M. Takashima, Lieutenant T. Isobe, and Mr. T. Imada. 270 pp. 12mo. Tokio, 1907. Z. P. Maruya. 2/6½.

This is a very carefully prepared and useful vocabulary; the Japanese portion is given both in the square character and in the Romanised form. Japanese terms

which have no exact equivalent in English, and *vice versâ*, are fully explained, *e.g.*: *Kakka*, Excellency (used in addressing general officers); *Sôninkwan*, Government officials of third rank (second lieutenants to colonels inclusive).

There are also a list of abbreviations, comparative tables of army rank (including Indian), notes on uniform, and a list of 1,200 characters most commonly used in military words, arranged under their radicals.

The Japanese preface is a reproduction of a quotation from a Japanese poem, written for the purpose by General Baron Oku, Chief of the General Staff. The sense of the quotation is that the words of those with whom one is in agreement are like the sweet scent of the orchis.

Löbell's Annual Report on Armies and Military Matters. XXXIIIrd. Edition, 1906. (v. Löbell's Jahresberichte über das Heer-und Kriegswesen, XXXIII Jahrgang, 1906.) Edited by Lieutenant-General v. Pelet-Narbonne. 529 pp. Two diagrams in text and one map. 8vo. Berlin, 1907. Mittler. 14/-.

Although useful as a book of reference and generally regarded in Germany as an infallible authority on universal army matters, the facts and opinions set forth in Löbell's Jahresberichte are not always accurate and sound, and are sometimes not up to date; consequently the information given should be accepted with some reserve.

The book is divided into three parts. Part I deals with the changes in strength, organisation, &c., in the armies of most countries for the year under review; Part II deals with the changes in those armies in the tactics of the various arms, permanent and field fortification, means of communication in the field, and small arms and artillery *matériel*, and includes reviews on the more important modern works on military history; whilst Part III gives an account of the military expeditions which have taken place in the several German Protectorates during the year, of the rebellion in the Yemen, and of the medical department in the campaign in German South-West Africa; an obituary for the German Army is given in the last pages.

As regards Part I, the information with respect to the German Army is good and accurate. Much new and useful information is given concerning the armies of the South American Republics (Argentina, Brazil and Chile), and the account of the main changes in the army of Bulgaria is reliable; as is also the account of the Belgian Army, though it should be noted that the figures given for the peace strength of the last named are those for 1902.

The account of the army in India is on the whole good, though inaccuracies occur, principally in the distribution of troops.

The information regarding the French Army is ample, and the details are extremely accurate, but an endeavour is made to represent the existence of a strong feeling of anti-militarism among the rank and file which is hardly in accord with the facts. It may also be noted that the deficiency in reserve officers has decreased by more than half since the publication of the figures for 1905, which are here quoted.

In connection with the army of Greece the facts set forth can be relied upon.

The account of the new reorganization of the British Army in six divisions is, with a few notable exceptions, accurate; the disadvantage also of frequent changes in organization does not escape notice. Few comments on the proposed Territorial Army appear, but enough is said to show that our hopes are regarded as somewhat optimistic. It is pointed out that discipline can hardly be taught in six months.

In dealing with the army of Italy, the war strength figures are given for 1901, and the distribution of the army is incorrectly stated.

A short and clear account of the army of the Netherlands is given, but some of the figures are inaccurate. The fact is lost sight of that the reorganisation of the army, now in progress, will not be completed till 1917, and the full strength of the *Landweer*, as it will obtain in that year, is given as being now in existence. The strength of the *Landweer* for 1906 is over-estimated by about 47,000, and the question of the "remaining portion" is not dealt with at all.

There is a good and concise account of the Norwegian Army, in which the main features of the proposed new organization (not yet in force) are set forth.

As regards the army of Austro-Hungary, the changes, which have evidently been taken from the official gazettes for the army and *Landwehr* may be accepted as correct, but the peace strength is under-estimated by about 20,000, and no mention is made of the fact that, owing to the recent political difficulties with Hungary, no military budget was voted for the year 1905-6, and that the belated estimates, in addition to those for 1906-7, were voted during the year under review.

The information regarding the Portuguese and Rumanian Armies is in the main correct, but in the case of the latter army the strength of the recruit contingent is under-estimated by about 6,000, and nothing is said of the proposed increase of an additional battalion to each infantry regiment.

There is a useful survey of the peace and war strength of the Russian Army, and of the changes in its organisation and training during 1906. The subject-matter is reliable as regards facts, but the opinions expressed as to how far the lessons of the recent war in the Far East have led to reforms are decidedly optimistic.

The report contains a good account of the Servian and Swedish army systems, but the total number available for war in the latter army is under-estimated by about 70,000, and the fact has been lost sight of that the fusilier battalions in the Swiss army have been increased by three. It may be observed that the war strength of the Spanish Army, some 458,000, is not given.

In the account of the Turkish Army the serious nature of the mutinies which have taken place in Anatolia and Syria, and among the men on board transports despatched for service in the Yemen is scarcely appreciated, and the statement that the construction of the next section of the Baghdad railway, over the Taurus Mountains to Adana, will with certainty be commenced in the spring of 1907, may be taken as being somewhat premature.

In Part II, the sections dealing with changes in the tactics of the three arms are instructive, that portion devoted to the recently issued new German Infantry Drill Regulations (p. 290) being specially interesting.

As regards Great Britain, it is stated that noteworthy progress has been made in the conduct of the infantry attack, that the artillery is excellent, but the weakness in cavalry is noticed and its efficiency in reconnaissance is questioned. The new "Field Artillery Training" is regarded as laying too little stress on what is practical, and the present "Combined Training" is stated to represent a very great advance on the previous edition of 1902.

Questions of ammunition supply and direct or indirect fire for artillery are discussed on pages 336 and 337, and considerable space is devoted to a description of the railways in German South-West Africa under "Means of Communication," pp. 401-5.

In the section dealing with small arms, inaccuracies appear in connection with the Danish Krag-Jorgensen /89 rifle, the muzzle velocity, and the number of cartridges in the magazine being incorrectly stated. There is an interesting account in this section (p. 422) of some experiments which have been carried out in the Netherlands with residues of smokeless powder in rifle barrels, and their tendency to produce rust.

The question of a field howitzer for Sweden is touched on (p. 443), and a useful comparative table for field guns and howitzers of all countries is given on pages 446-9

In Part III short accounts are given of the Hottentot rebellion in German South-West Africa during 1906, the minor operations in German East Africa resultant on the rebellion of 1905, various military expeditions which have taken place in the Kameruns during the year under review, and minor troubles in New Guinea.

In the account of the revolt in the Yemen, also dealt with in this Part, it is stated that the rebellion is now completely overcome, in spite of the fact that the position of the Turks is still very precarious.

The Indian Army. Reprinted from the 3rd edition of the "Imperial Gazetteer." 60 pp. (pamphlet). 8vo. Oxford, 1907. Clarendon Press. 1/- net.

The history and organization of the Indian Army are briefly traced from the earliest days under the Company, and a description is given of the present military organization, with details of the commands, departments and administration.

The pay, promotion and training of officers of the Indian Army, organization and strength of British regiments, and the composition of the native army and the auxiliary forces in India are shown, also mobilization arrangements, and army expenditure.

Two appendices give army statistics on January 1st, 1906.

This sketch has been issued by the Government of India with the sanction of the Secretary of State for India, in order that it may be in the hands of young officers destined for appointments in the Indian Army, and also of all those who take an interest in the military problems connected with our vast Imperial possessions in the East.

Armee—Almanach, 1907. A handbook of military statistics concerning all armies. Compiled from authentic sources by Captain Alois Veltzé. Edited by Captain Hugo Kerchnawe, General Staff. 678 pp. 12mo. Vienna and Leipzig, 1907. C. W. Stern (Buchhandlung L. Rosner). 8/-.

It is stated in the preface that the first edition of this book was so favourably received in many countries that it was decided to issue it annually. Permission has been asked for its translation into Russian and arrangements are being made for its publication in other languages also.

The armies of sixty-two States in all are enumerated in the contents, including some of such doubtful military interest as Bhotan, Ecuador, Haiti, Costa Rica, Maskat, Monaco, and San Marino (in Central Italy).

The military data are terse and compressed, but the articles dealing with the more important armies extend to a considerable length, *e.g.*, Russia, 97 pp.; German Empire, 71 pp.; France, 64 pp.; Austria-Hungary, 42 pp.; Italy, 37 pp.; Great Britain and India, 51 pp.; though 11 pp. are considered sufficient for Japan.

Numerous tables, sketch maps, and good illustrations of various types in the armies described enhance the general interest of the work, which contains a mass of information in convenient form for those who have not access to (and perhaps do not require) more elaborate and full official data.

In such a collection of detailed statements and figures it can hardly be expected that the book should be entirely free from errors, but the matter is clearly printed, and the arrangement adopted makes reference easy. So closely packed with information as it is, the book is not light reading.

REPORTS.

Annual Report of the Military Council for the Dominion of Canada, 1906. 58 pp. 8vo. Ottawa, 1907. 5 cents.

This official report deals with the advances made during 1906, in the efficiency and conditions of service of the Canadian Militia; the training carried out by the troops and the results attained; details as to changes in organization, collection of intelligence, military surveys, camps, authorized training establishments, numbers trained, signalling and musketry instruction, schools of instruction, cadet corps, equipment, armament and military expenditure. The appendices include the reports of the Inspector General Canadian Forces, the Director-General Medical Services, and the Superintendent of the Dominion Arsenal.

Camps of Instruction, 1906 (*U.S.A*). 269 pp. 8vo. Washington, U.S.A., 1907. Government Printing Office.

Contains the reports of the commandants of the various camps of exercise in the United States. Owing to the comparatively small numbers of troops assembled, the reports contain little of tactical interest, and deal mainly with questions of organisation and administration, regarding which the commandants offer several interesting suggestions. Regular troops and the "National Guards," which correspond to our Volunteers, are trained together in these camps, and some idea of the military value of the latter may be gathered from the reports.

GENERAL.

A Nation in Arms. By F.-M. Earl Roberts, V.C., K.G. 222 pp. 8vo. London, 1907. John Murray. 1/-.

This work gives in book form the several speeches and addresses which Earl Roberts has made during the past eighteen months "on the unpreparedness of the country for war." The book should be read by all soldiers.

The Defence of the Realme. By Sir Henry Knyvett, 1596, now for the first time printed from a MS. in the Chetham Library, Manchester. 69 pp. 8vo. Oxford, 1906. Clarendon Press.

In this Treatise an Elizabethan soldier advocates compulsory military training for all Englishmen. The general idea of Knyvett's pamphlet is that if the manhood of England were properly organized, the country might be made safe against invasion. The problem was almost the same as at the present time. Our fleet was the best in the world. If the invading army could be caught on the high seas, the men who had fought with Drake could answer for the safety of the country. But our fleet could not be everywhere, and those who knew most were the most uneasy as to what might happen if a Spanish Army were once landed on English ground.

The Problem of National Defence. By Major C. Ross, D.S.O., The Norfolk Regiment. 350 pp. 8vo. London, 1907. Hutchinson. 12/-.

This book is a powerful plea for universal military service, and is an important contribution to the literature of national defence. The author begins with a general exposition of the nature of war and the principles of success in war, and to support his deductions instances the cases of other nations ancient and modern. He then applies his arguments to the individual case of Great Britain, and points out the possible course of events in the event of war between this country and another European nation, and shows how in the case of war the offensive power of this country is limited to naval action, since, owing to the limited strength of its land forces, it cannot assume the offensive on land, without which success in war is impossible, or at least doubtful. In his last two chapters he points out that universal military service is the only remedy for the existing state of things, and shows that it might well be beneficial to the nation at large.

Offence not Defence, or Armies and Fleets. By Captain C. Holmes Wilson, R.F.A. 169 pp. With maps and plans. 8vo. London, 1907. Allen. 3/6

This book, as may be inferred from the title, is a plea for the strengthening of our land forces and for a form of universal service. The author draws a parallel between the "position formerly occupied by Carthage and that now held by England." To illustrate this he gives a sketch of the fall of Carthage and the defeat of Hannibal. In later chapters he draws attention to the fact that sailors, in common with the rest of humanity, are liable to make mistakes, and gives instances in which the British fleet failed to prevent the landing of an enemy. In the last two chapters he deals with the present situation and the need for some form of compulsory service.

Frontier Warfare and Bush Fighting. Official. 152 pp., with diagrams. 12mo. Calcutta, 1906. Superintendent Government Printing. 14 annas.

This book contains notes on Frontier Warfare (Skirmishing, Scouting, Company and Battalion Training, Lines of Communication and Artillery) and Bush Fighting (Tactics, Hints on Clothing, Sanitation, &c., Employment of British and Native Troops, Transport, Strength and Composition of Columns, Desert Africa, Stockades and Zaribas, Guides and Interpreters, &c., &c.). A review of the book appears in the "Pioneer Mail" of 17th May, 1907.

The Evolution of Tactics. By Major G. Gilbert, Indian Army. 193 pp. with plans. 8vo. London, 1907. Rees. 7/6.

densation was specially aimed at. It is only intended to put others on the track of what to read and what to look for. The reader must think for himself.

The best description of this book may be given in the author's introduction: "It is, after all, only a brief survey of a wide range of military history, but this con-
It must be allowed that it would appear that the author has attained his object. He traces the evolution of tactics from the days of Alexander and Cyrus down to

the South African War, and points out what advances in the science of tactics were made by each great military commander. To indicate the wide scope of the book it will suffice to say that the author includes operations of Hannibal, Cæsar, Gustavus Adolphus, Turenne, Marlborough, Frederick the Great, Napoleon, Moltke and Lord Roberts. The last chapter is entitled "Problems of the Future"; it contains a great deal of matter which provides food for thought, and the author's arguments and conclusions are put in a clear and convincing way. A paragraph from this chapter may be quoted: "With all our faults and shortcomings, our constant and unique experience in warfare is the envy of foreign military men. Above all, we soldiers must think together. We have the greatest need for a characteristically English school of military thought."

Altogether this book is well worth reading, and it is to be hoped that it may attain its object, which is to induce officers to study the battles and campaigns of which it gives a brief summary. The plans which illustrate the battles are excellent.

Four Tactical Studies (Quatre études tactiques). By General De Jacquelot du Boisrouvray. 149 pp. 8vo. Paris, 1906. Berger-Levrault, 5 Rue des Beaux Arts. 2/6.

A reactionary book, abounding with definitions of definitions, and delighting to divide ordinary military operations into purely theoretical phases. The four essays deal with:—

(1) The front. (2) Phases of advanced-guard actions. (3) Offensive defence. (4) Flank marches.

(1) In reading the first essay one is forcibly reminded of General D'Ordel's playful definition of the "front" as "the real (or supposed) direction of the enemy."

(2) The three historical examples of advanced-guard actions are interesting, but not new. The old stock example of the action of the advanced guard of the XIth Army Corps on the 6th August, 1870, is included.

(3) When we find here the offensive defence divided into (1) the counter-attack partial, (2) the counter-attack general, (3) the offensive return, (4) the passage to the offensive, &c., one is almost inclined to add, with Touchstone, "the counter-check quarrelsome." A good example of a general counter-attack is that delivered by Dauber's Brigade upon the left flank of the Sardinians at the battle of San Martino on the 24th June, 1859.

(4) The last essay is far the best, and the historical examples of flank marches and actions of flank guards are good, especially the latter.

Dangers of Firing with Blank Cartridge. (Dangers des Tirs à Blanc.) By Dr. Bonnette. 232 pp., with 45 illustrations in the text. 4to. Paris, 1907. Maloine, 4/2.

The work contains a preface by Prof. Nimier of the Val-de-Grâce, and is intended to draw attention to the serious nature of wounds caused by ignorance or neglect of ordinary precautions in the use of the rifle, loaded with blank cartridge, during manœuvres, &c. An average of 15 to 20 serious accidents occur annually from this cause in the French Army, one or two of them being fatal. The book is a complete and exhaustive work on the subject of the dynamic and wounding effects of blank cartridge.

Rifle Clubs. (Les Sociétés de Tir.) By Lieutenant Thiery, 89th Infantry. 55 pp. 12mo. Paris, 1906. Berger-Levrault, 5 Rue des Beaux Arts. 10*d*.

A somewhat long-winded but interesting pamphlet on a subject which is attracting a good deal of attention in England at the present time. The writer, who has devoted much study to the subject, advocates the formation of mixed (civilian and military) rifle clubs, where the instruction should be varied and frequently carried out in approximation to service conditions. Many of the conclusions are based upon the experience of the South African War.

Scouting and Reconnaissance in Savage Countries. By Captain C. H. Stigand, F.R.G.S., Royal West Kent Regiment. 134 pp., with 3 star charts. 6½ by 4½ inches. London, 1907. Rees. 5/-.

This book contains useful hints on methods of finding the way in an unknown country by bearings from the sun, moon and stars and by landmarks, with instructions how to tell the time by the sun, moon and stars in various latitudes. In order to be able to use the stars, three star charts are contained in a pocket at the end of the book and clear instructions for using them are given in an Appendix. Other chapters contain hints for scouts in savage countries with notes on tracking, tribal customs and differences, and the reconnaissance of hostile kraals and villages. A second Appendix contains some examples of exercises for scouts. The book is bound in stout canvas and has a pocket, pencil and a number of blank pages. It is fastened by a flap with a catch. The book is recommended to the notice of all officers employed or quartered in uncivilized countries.

Practical Topography. (Topographie Pratique). By E. de Larminat. 391 pp. With Supplement (4to. 32 pp.), containing a specimen of triangulation work. 8vo. Paris, 1907. Lavauzelle, 10 Rue Danton Boulevard St. Germain. 8/6.

A useful book for the advanced student of topography or for the officer who finds himself in an unmapped country. Work with the theodolite is explained, as also the methods of taking astronomical observations of practical value.

Field Fortification. (Die Feldbefestigung). By W. Stavenhagen. 50 pp., with 52 diagrams. 8vo. Berlin, 1907. Mittler. 11*d.*

A useful handbook by an able and prolific writer, who impresses upon his readers the importance of artificial cover in the field. Field fortification is a good servant but a bad master, for, as many a battle has been won by its judicious and moderate employment, so many an opportunity in battle has been lost by the fact that the movements of the troops employed were restricted by works previously constructed. The author enters into details of the various official modes of providing cover for troops and guns in the field. At the end of the pamphlet are a few valuable pages upon the attack of a fortified position in the field.

Military Balloon Service. (Servicio Aerostàtico Militar). By D. Francisco de Paula Rojas, Comandante de Ingenieros (Major of Engineers.) 248 pp., 52 diagrams and illustrations. 8vo. Madrid. 1906. Imprenta del Memorial de Ingenieros. 9/1.

The book is divided into five parts, in the first of which the author treats of the principal uses to which balloons may be put and the history of their employment in foreign countries, concluding with an account of the organization of the balloon service in the Spanish Army. The second and third chapters contain details of the production of hydrogen gas, its compression, transport and employment on service; while the two concluding chapters are devoted to questions of captive and free ascents. The author is said to be a great authority on the subject of aerostatics, and his book is most favourably reviewed in the Spanish military magazines.

Manœuvres of the Fourth (Swiss) Army Corps, 1906. (Die Manöver des IV. Armee Korps, 1906.) By Lieutenant Karl Egli, of the General Staff. 61 pp. 8vo. Basel. 1907. Benno Schwabe.

A good critical account, in which Equipment, Retreats, General and Special Ideas, Truces and Information are dealt with. This pamphlet should be useful to officers attending foreign manœuvres.

Horses, Saddles and Bridles. By General William H. Carter, United States Army. 3rd Edition. 405 pp., with numerous illustrations. 8vo. Baltimore, U.S.A. 1906. 11/9.

Among other subjects, this book deals with the Cavalry Horse, Bitting and Training, Saddles, Modern Cavalry and its Equipment, Stable Management, Diseases and Injuries, Veterinary Supplies and Prescriptions, Forage, Transportation of Horses by rail and at sea.

It is a useful study for officers of the mounted branches.

PART II.

OTHER WORKS NOT DEALT WITH IN PART I.

A.

Airship, The; its historical development to the present time. (Die Luftschiffahrt.) By A. Hildebrandt. 426 pp. With illustrations. 8vo. Berlin, 1907. Oldenburg. 15/-.

Africa, S.W., My observations in. (Meine Beobachtungen in Süd-West Afrika.) By Dr. Semler. 80 pp. 8vo. Hamburg, 1906. Herrmann's Erben. 1/10.

Allies, The. (England and Japan.) By Major-General Sir H. Colvile, K.C.M.G., C.B. 287 pp. 9 by 5¼ inches. London, 1907. Hutchinson. 16/.

Amharic Language, practical grammar of the. (Praktische Grammatik der Amharischen Sprache.) By Ludwig Mahler. 223 pp. 8vo. Vienna, 1906. Published by the author, I. Wollzeile 6. 12/-.

Anglo-Japanese Alliance. (Nach dem Englisch-japanischen Bündnis.) By Dr. Hans Plehn. 214 pp. 8vo. Berlin, 1907. Curtius. 3/6.

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W.

Wireless Telegraphy, The employment of, on the railway. By H. Thurn. K.T.Z., p. 222, 1907.

Y.

Yellow Fever in Africa. By Dr. Otto. A.F.H., p. 147, Vol. XI (5), 1907.

Yeomanry, The. By Squadron Leader. B. Mag., May.

ABBREVIATIONS.

Abbreviation.	Name of Newspaper or Periodical.		Place of Publication.
A.F.H. ...	Archiv. für Schiffs und Tropen Hygiene ...	½M.	Leipzig.
A.M.B. ...	Artilleristisches Monatshefte	M.	Berlin.
A.M.P. ...	Archives de Médecine et de Pharmacie Militaire	M.	Paris.
A.S.C. ...	Army Service Corps Quarterly	Q.	Aldershot.
B. Mag. ...	Blackwood's Magazine	M.	Edinburgh.
Con. ...	Continent, Der	M.	Berlin.
C.M.G. ...	Canadian Military Gazette	F.	Montreal.
C.J. ..	Cavalry Journal	Q.	London.
C.R. ...	Contemporary Review	M.	London.
C.S.M. ...	Cassier's Magazine	M.	London & New York.
D.M.Z. ...	Deutsche Militärärztliche Zeitschrift	M.	Berlin.
D.R. ...	Deutsche Revue	M.	Stuttgart.
Emp. R. ..	Empire Review	M.	London.
F. Rev. ..	Fortnightly Review	M.	London.
G.J. ...	Geographical Journal	M.	London.
G.R. ...	Grande Revue	M.	Paris.
Inj. ..	Injeniernii Jurnal	M.	St. Petersburg.
I.R. ...	Internationale Review (Armeen und Flotten)	M.	Dresden.
J.D.A.M....	Jahrbücher für die Deutsche Armee und Marine	M.	Berlin.
J.M.S.I. ...	Journal of the Military Service Institution ...	2M.	Governor's Island, N. York.
J.R.A.M....	Journal of the Royal Army Medical Corps ..	M.	London.
J.S.M. ...	Journal des Sciences Militaires...	M.	Paris.
J.U.S.I. ...	Journal of the Royal United Service Institution	M.	London.
K.M. ...	Kavalleristische Monatshefte	M.	Vienna.
K.T.Z. ...	Kriegstechnische Zeitschrift	M.	Berlin.
L.R.I. ...	La Revue d'Infanterie	M.	Paris.
L.S.M. ...	Le Spectateur Militaire	F.	Paris.
M.A.G. ...	Mittheilungen über Gegenstände des Art.-u. Genie-Wesens	M.	Vienna.
M.I.E. ...	Memorial de ingenieros del ejército	M.	Madrid.
M.R. ...	Monthly Review	M.	London.
M.W.B. ...	Militär-Wöchenblatt	W.	Berlin.
N.A.R. ...	North American Review...	F.	New York.
N.C. ...	Nineteenth Century	M.	London.
N.I.A. ...	Nation in Arms	M.	London.
N.R. ...	National Review	M.	London.
O.M.Z. ...	Österreichische Militärische Zeitschrift ...	M.	Vienna.
P.R.A.I. ...	Journal of the Royal Artillery	M.	Woolwich.
P.U.S.I. ...	Journal of the United Service Institution of India	Q.	Simla.
Q.D. ...	Questions Diplomatiques et Coloniales ...	F.	Paris.
Q.R. ...	Quarterly Review	Q.	London.
R.C. ...	Revue de Cavalerie	M.	Paris.
R. d'A. ...	Revue d'Artillerie	M.	Paris.
R.E.J. ..	Royal Engineers' Journal	M.	Chatham.
R.H. ...	Revue d'Histoire	M.	Paris.
R.I. ...	Russkii Invalid	D.	St. Petersburg.
R.M.E. ...	Revue Militaire des Armées étrangères ...	M.	Paris.
R.M.G. ...	Revue Militaire générale	M.	Paris.
R.M.I. ...	Rivista Militare Italiana	M.	Rome.
R.M.S. ...	Revue Militaire Suisse	M.	Lucerne.
S.Z.A.G....	Schweizerische Zeitschrift für Artillerie und Genie	M.	Frauenfeld.

D., published daily; W., weekly; F., fortnightly; M., monthly; Q., quarterly.

ABBREVIATIONS.—contd.

Abbreviation.	Name of Newspaper or Periodical.		Place of Publication.
U.S.C. ...	United States Cavalry Association Journal ...	Q.	Fort Leavenworth.
U.S.M. ...	United Service Magazine (Colburn's)	M.	London.
V.S. ...	Voyenii Sbornik	M.	St. Petersburg
V.T.H. ...	Vierteljahrshefte für Truppenführung und Heereskunde	Q.	Berlin.
W.M.W. ...	Wiener Medizinische Wochenschrift	W.	Vienna.
W.R. ...	Westminster Review	M.	London.

W., published weekly; F., fortnightly; M., monthly; Q., quarterly.

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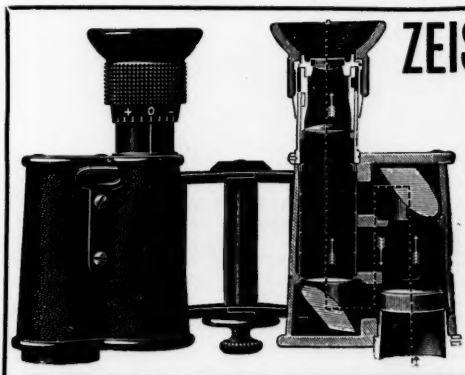

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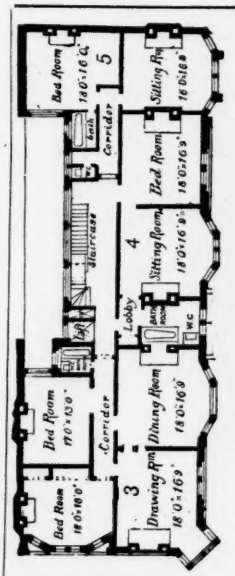

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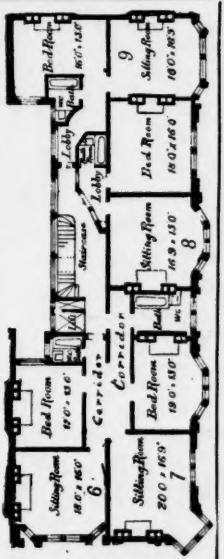

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